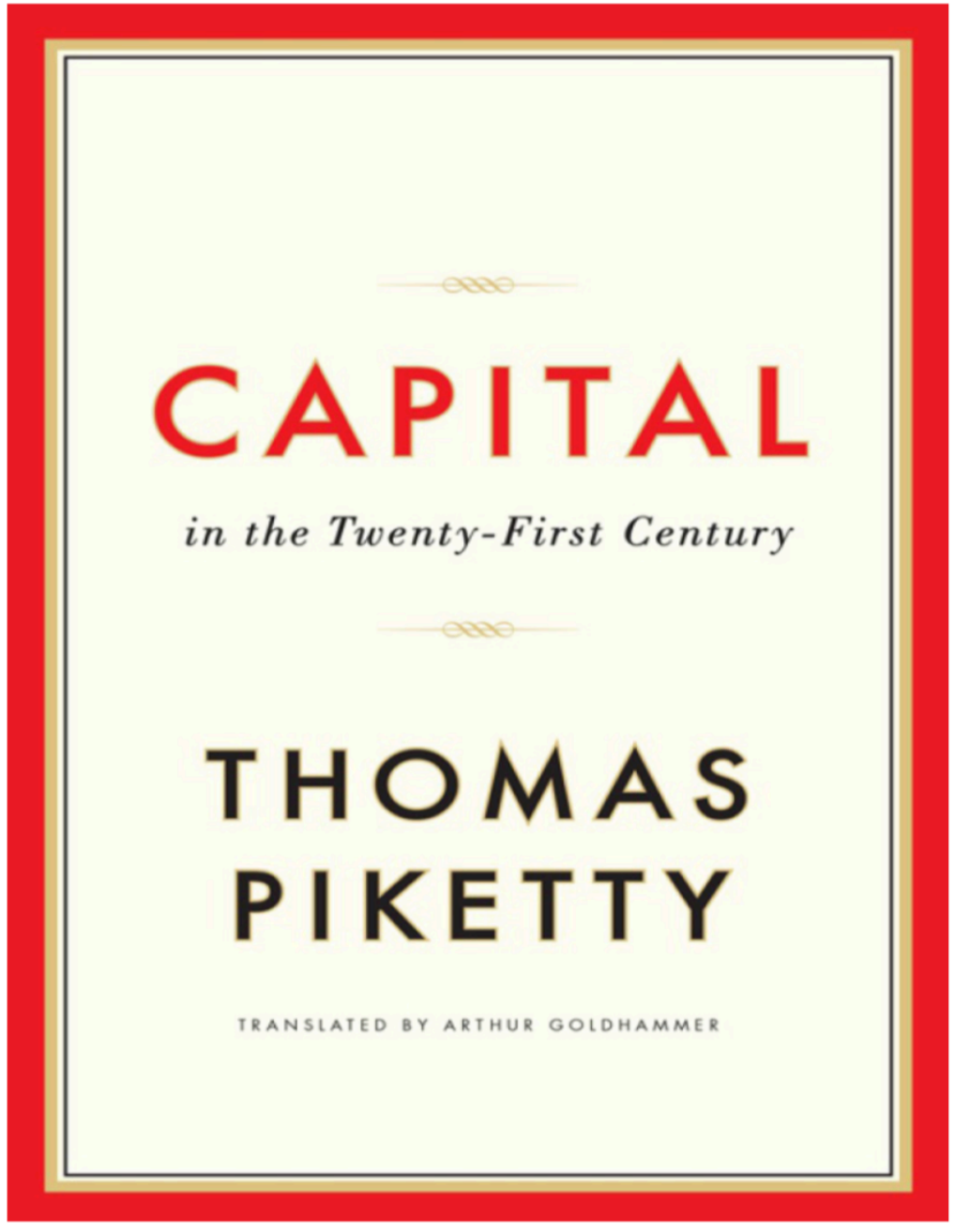
EC2106 PUBLIC ECONOMICS
LECTURE 6 - Taxes on capital and savings

David Seim

Fall 2022


CAPITAL
in the Twenty-First Century
THOMAS
PIKETTY
TRANSLATED BY ARTHUR GOLDHAMMER

Motivating facts for capital taxation

1. Capital income amounts to 25-30% of national income (labor income is 70-75%).
   - **Capital income** and **wealth** much more unequal than labor income.

     $\Rightarrow$ Tax capital from equity-perspective (dimishing MU-argument).

2. Capital accumulation **correlates** with GDP-growth.
   - **Tax** on capital income (or wealth) $\Rightarrow (1-\tau) \Downarrow$

     $\Rightarrow$ capital accumulation $\Downarrow$ and GDP-growth $\Downarrow$.

   - Efficiency cost of capital taxation may be high.

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3. Capital much more **mobile** compared to labor.

   $\Rightarrow$ Capital flight to tax havens serious concern.

   - Who bears the burden of the tax?

     (Remember general lesson: *Inelastic parties bear the burden.*)

   - If owners **cannot** respond (example: property tax, can not move a house to tax haven), owners bear the burden.

   - If owners **can** respond, owners do **not** bear the full burden.

     Mechanism: Tax on capital $\Uparrow$ $\Rightarrow$ Capital flight $\Rightarrow$ Domestic capital stock $\Downarrow$ $\Rightarrow$ Wages $\Downarrow$ $\Rightarrow$ Workers bear the burden.

4. Equity-perspective depends on how wealth is generated.

   (i) Inheritances

   (ii) Self-made wealth

   (iii) Rate of return

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Wealth and capital income concepts

Definition: Return on Wealth holdings = Capital income.

Components:

+ **Housing:** Residential real estate (land and buildings); income: rents.
+ **Corporate equity:** Corporate stocks (held directly and through funds); dividends + retained earnings.
+ **Unincorporated equity:** Small firms (sole proprietorships, *egenföretagare*, *fåmansbolag*); individual profits.
+ **Fixed claim assets:** Currencies, cash, deposits, bonds; interest income.
+ **Other assets:** Consumption durables (jewelry, cars, art), human capital; labor earnings.
+ **Capital gains:** Price changes.
- **Liabilities:** Mortgages, credit card debt, options, other loans. interest payments.

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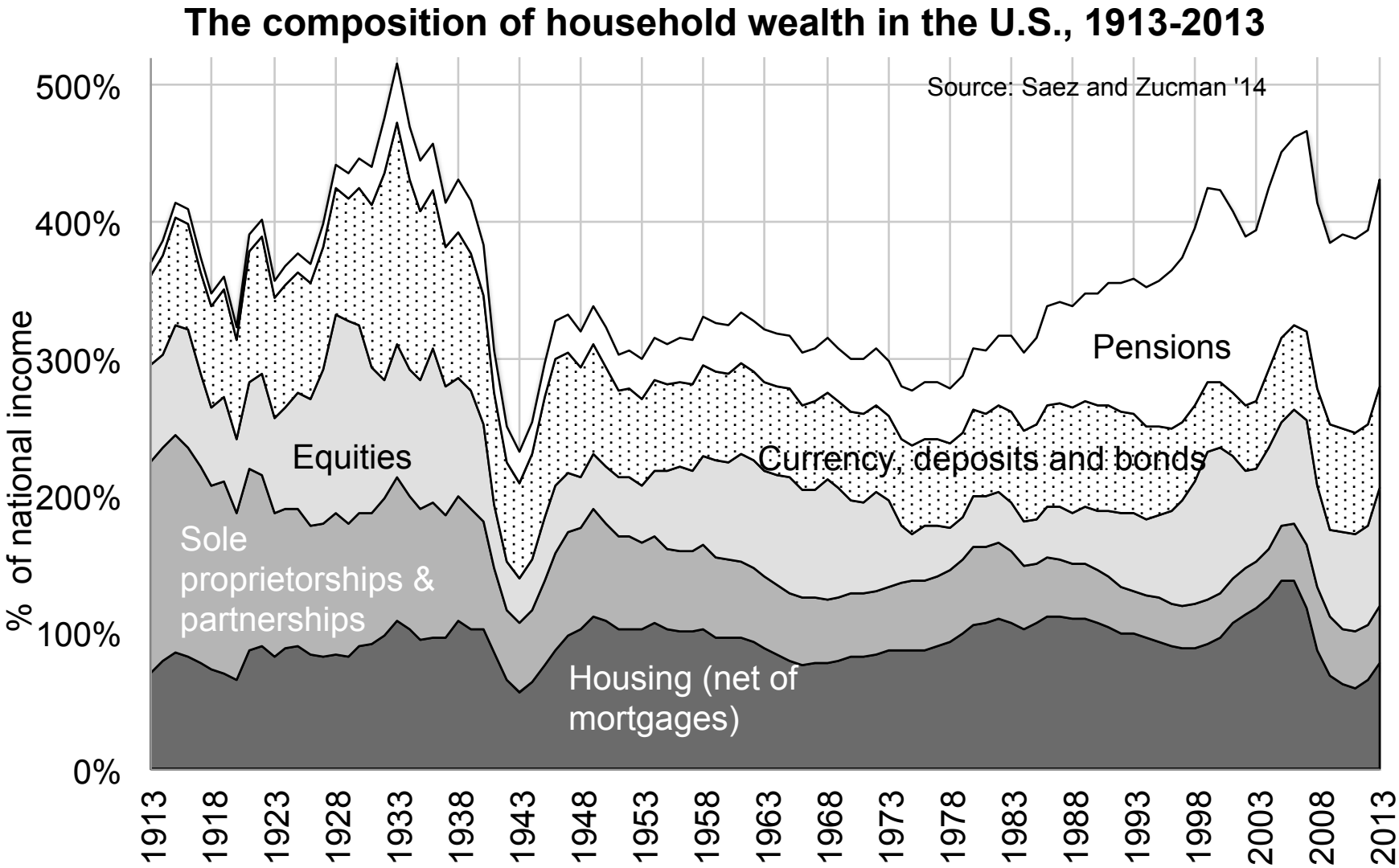
+ **Fixed claim assets:** Currencies, cash, deposits, bonds; interest income.

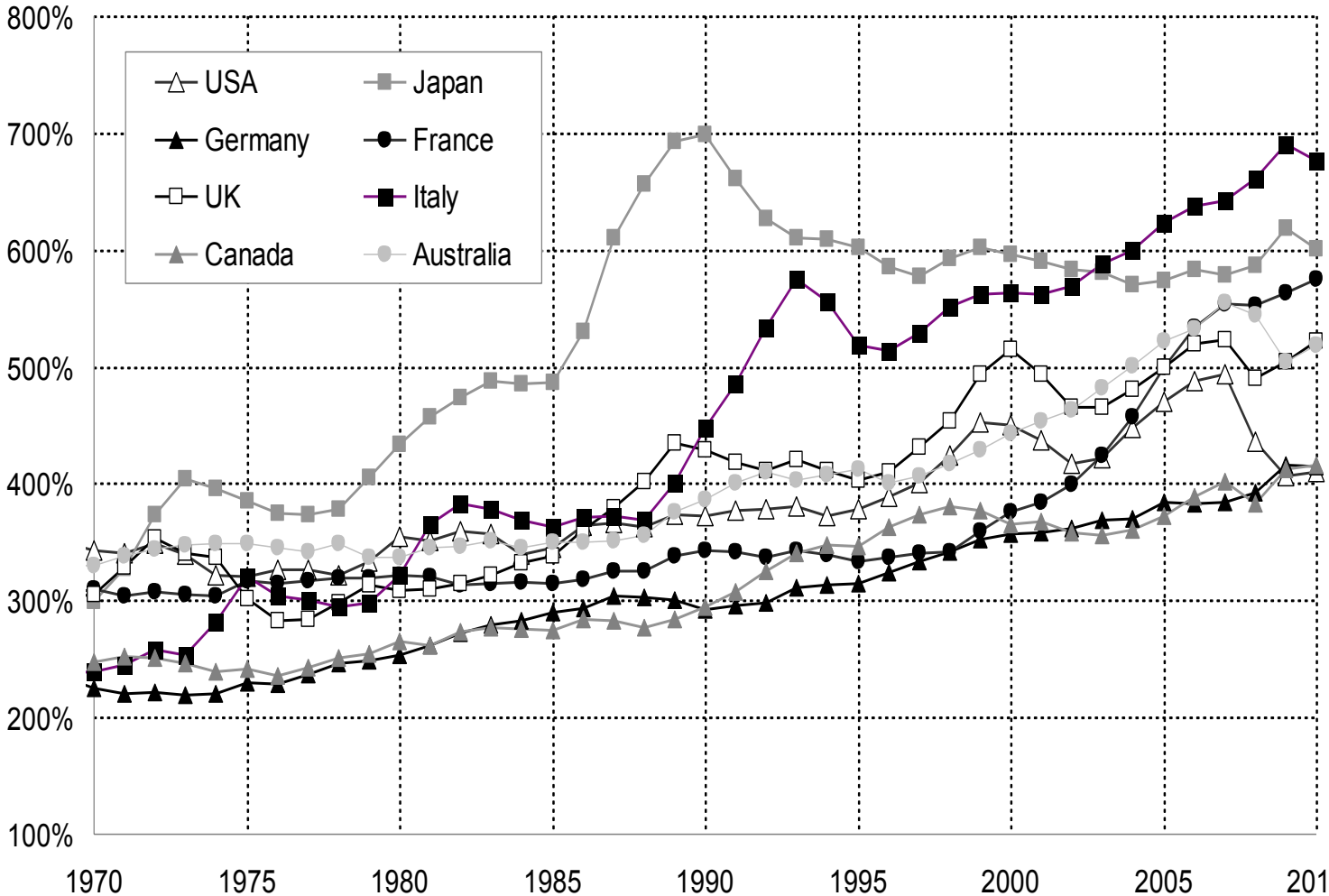
+ **Pension funds:** Equity + fixed claim assets held by pension funds.

- **Liabilities:** Mortgages, credit card debt, options, other loans. interest payments.



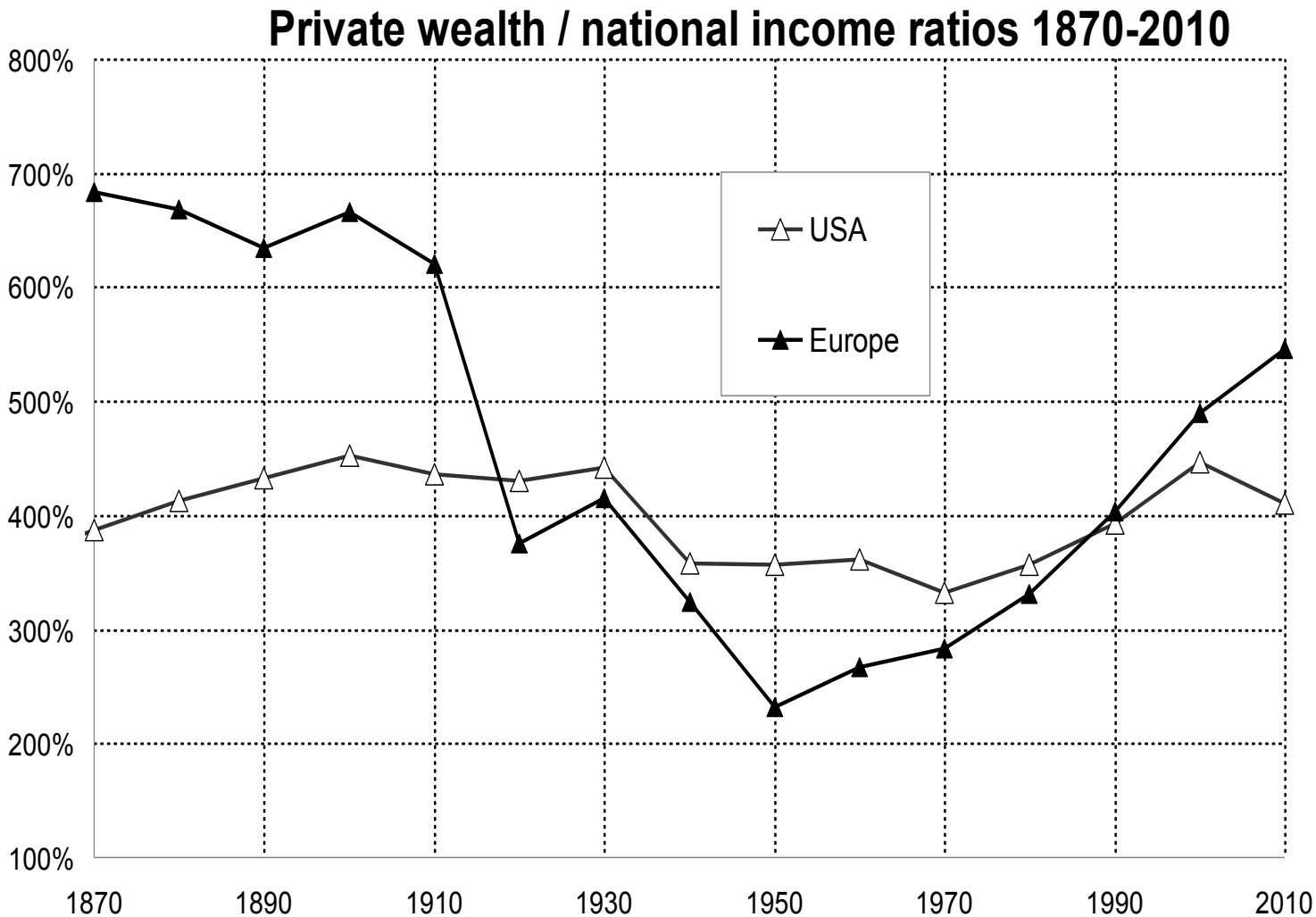
This figure depicts the evolution of the ratio of total household wealth to national income. This ratio has followed a U-shaped evolution and the composition of wealth has changed markedly since 1913. Source: Appendix Table A1.

Private wealth / national income ratios, 1970-2010



Authors' computations using country national accounts. Private wealth = non-financial assets + financial assets - financial liabilities (household & non-profit sectors)

Source: Piketty and Zucman '13



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Wealth accumulation

- How does an individual's wealth evolve?

$$W_t = W_{t-1} + r_t W_{t-1} + I_t + (E_t - C_t),$$

  where W = wealth, r = net rate of return, I = net inheritances, E = labor earnings and C = consumption (bracketed term is **savings**).

- Differences in wealth arise due to:
  1. Age
  2. Self-made wealth $(E_t - C_t)$.
  3. Inheritances, I
  4. Rates of return, r_t.

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Facts on wealth inequality

1. Wealth inequality is very **high**. Much higher than income inequality.
   - Top 0.1 % of income hold around 6 % of total income in the US in 1999.
   - Top 0.1 % of wealth hold around 15 % of total wealth in the US in 1999.
2. The evolution of wealth inequality follows a **U-shaped pattern**.
3. The exact magnitudes of wealth inequality levels and trends are not known.
   - Debated by academics.
   - No admistrative population-wide data exist in the US, nor in Sweden (since 2007).

Wealth Inequality When Wealth Is Not Observed

- Start from capital income:

$$k_{i,a,t} = r_{i,a,t} W_{i,a,t-1},$$

where $k_{i,a,t}$ is capital income of individual i in asset class a at time t – observable in tax returns (as capital income is taxed).

- W and r are unobserved. We want to know

$$W_{i,a,t-1} = \frac{k_{i,a,t}}{r_{i,a,t}}.$$

- Use knowledge of $\sum_i W_{i,a,t-1} = \bar{W}_{a,t-1}$ from National Accounts:

$$\bar{r}_{a,t} = \frac{\sum_i k_{i,a,t}}{\bar{W}_{a,t-1}}.$$

- An estimate of individual i's wealth is then:

$$\tilde{W}_{i,a,t-1} = \frac{k_{i,a,t}}{\bar{r}_{a,t}}.$$

- Key assumption?

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The Economist

Brassed off with Donald Trump

China's forgotten migrant workers

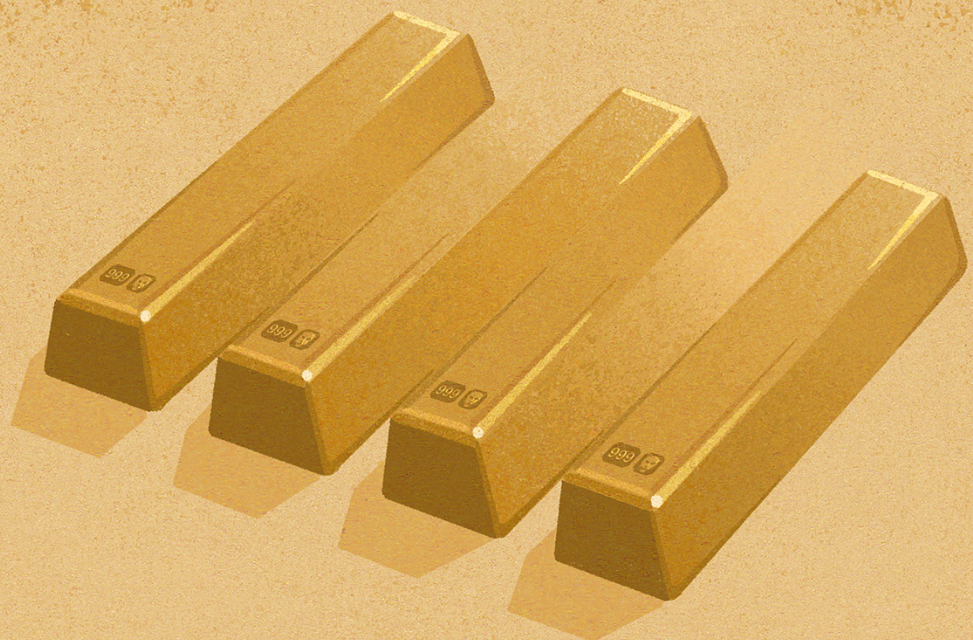
Pushing the limits of luxury

Alibaba's Amazon envy

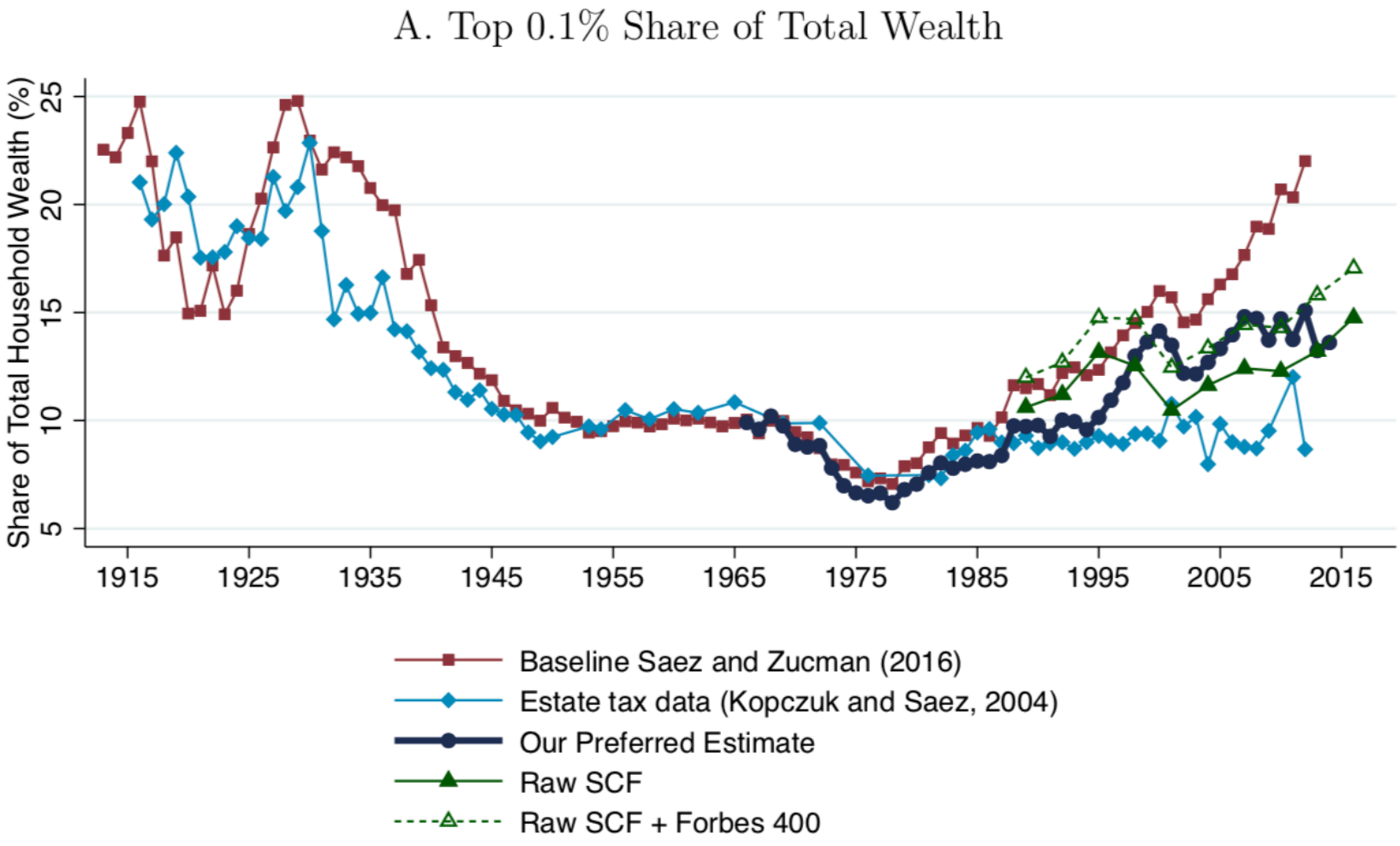
NOVEMBER 30TH–DECEMBER 6TH 2019

Inequality illusions

Why wealth and income gaps are not what they appear



Wealth concentration in the US



- Source: Smith et al. (2019).

- What do people know? Does it matter?

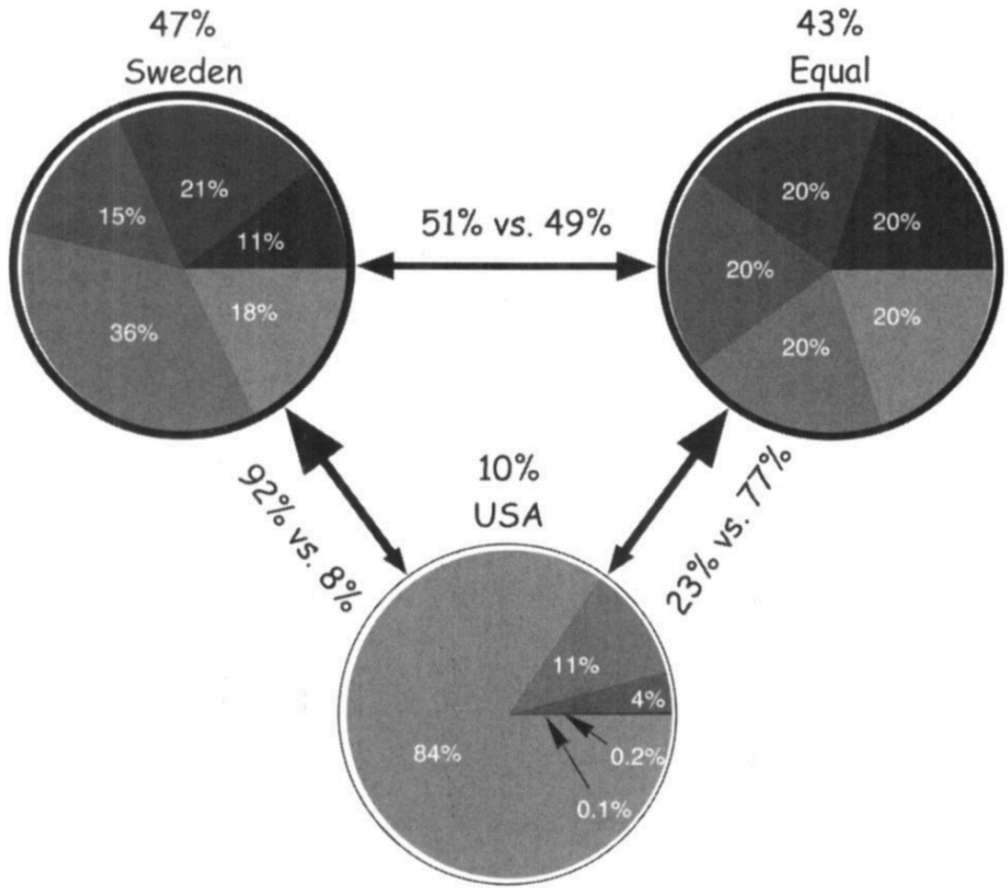


Fig. 1. Relative preference among all respondents for three distributions: Sweden (upper left), an equal distribution (upper right), and the United States (bottom). Pie charts depict the percentage of wealth possessed by each quintile; for instance, in the United States, the top wealth quintile owns 84% of the total wealth, the second highest 11%, and so on.

- Source: Norton and Ariely (2011).

- www.menti.com
- Passcode:

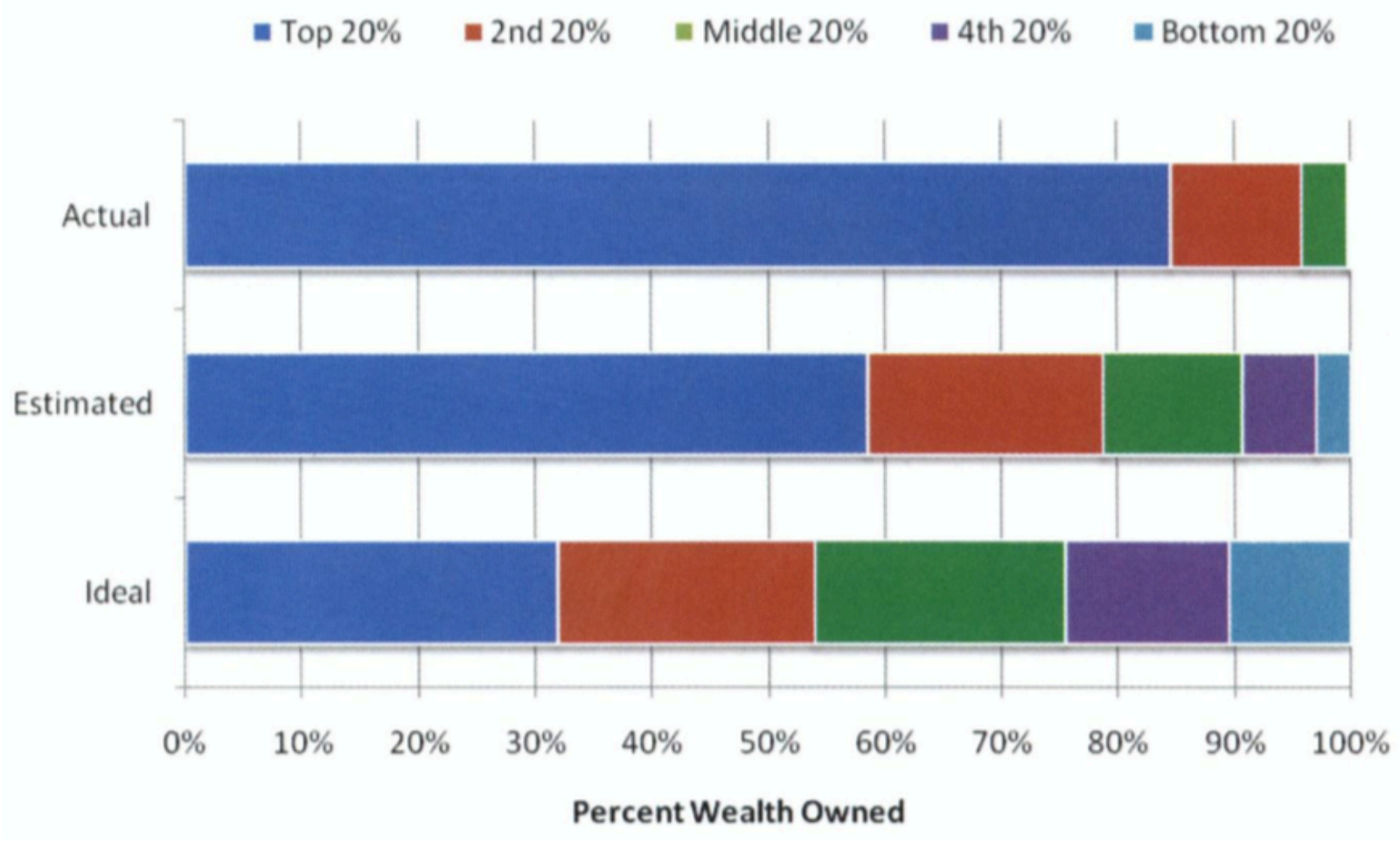


Fig. 2. The actual United States wealth distribution plotted against the estimated and ideal distributions across all respondents. Because of their small percentage share of total wealth, both the "4th 20%" value (0.2%) and the "Bottom 20%" value (0.1%) are not visible in the "Actual" distribution.

- Source: Norton and Ariely (2011).

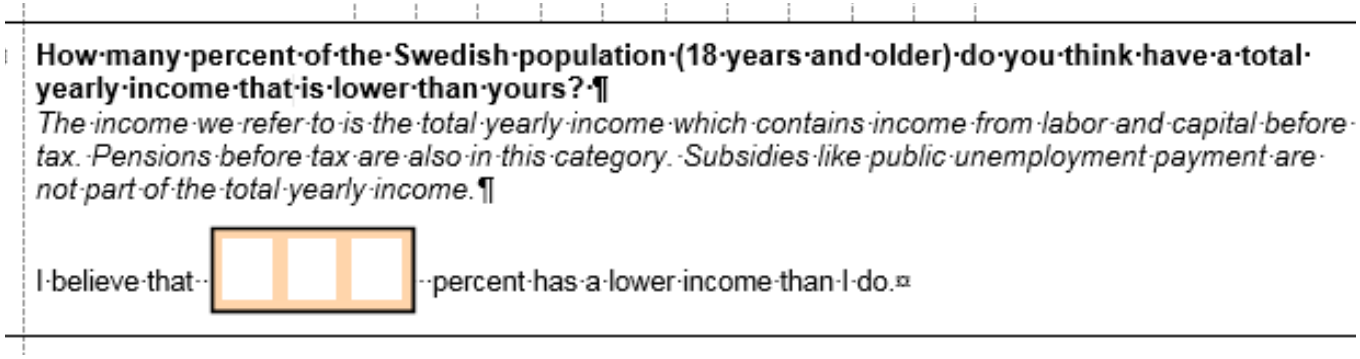
Application

- Karadja, M., J. Mollerstrom and D. Seim. (2014): "Richer (and Holier) than Thou? The Effect of Relative Income Improvements on Demand for Redistribution."

- Questions:
  - Are individuals aware of where they are located in the income distribution?
  - Does correcting their misperceptions influence political preferences?

Redistribution and Information

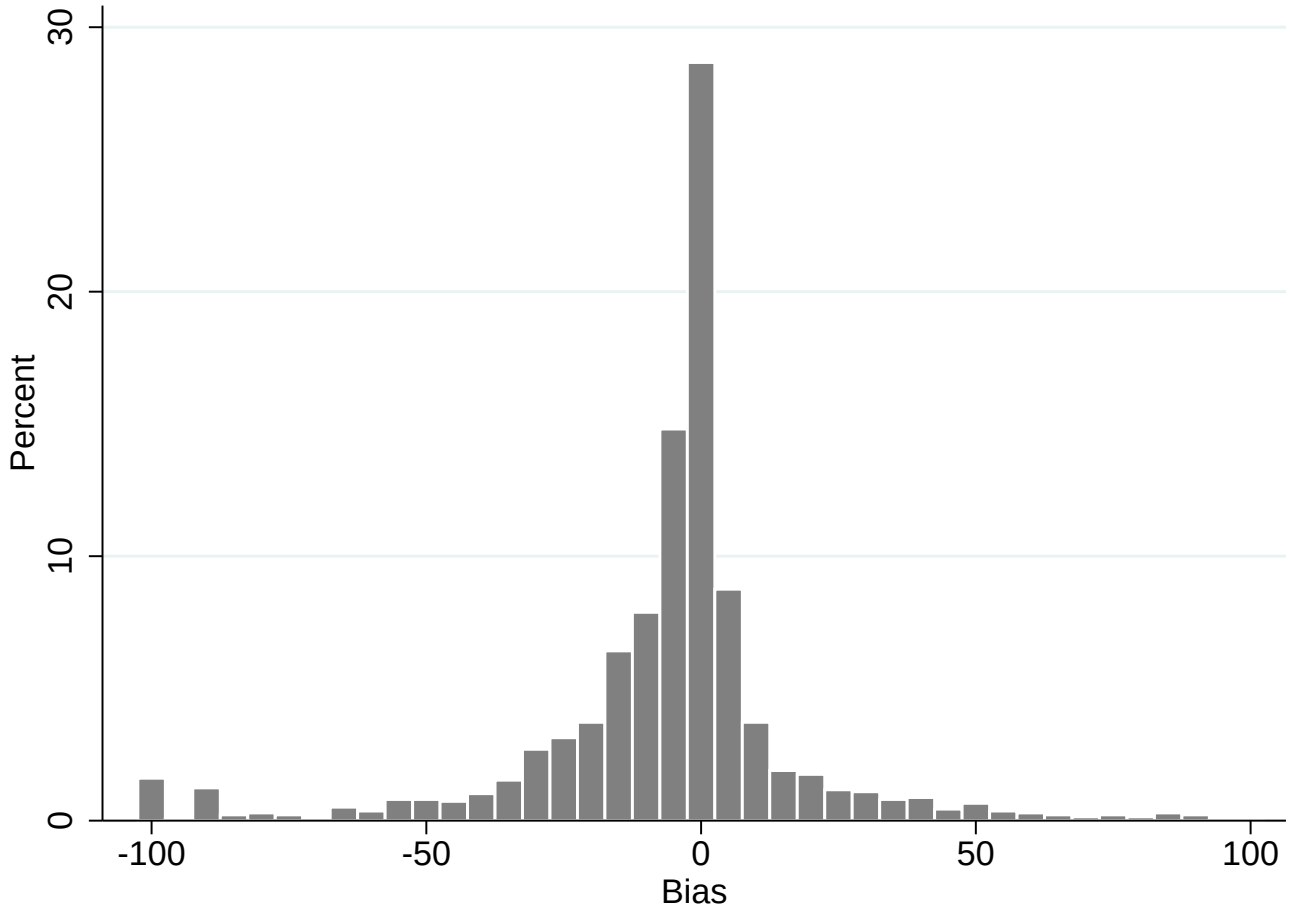
- How much income redistribution should we have in society?
- People's view will reflect their **perception** of the income distribution.
- Our research design:
  - Conduct a tailor-made survey about redistribution to representative sample.
  - Sent out by Statistics Sweden in May 2011 to 4300 people.
- Belief about position:



- www.socrative.com
- Room: PUBLICFINANCE

Do they know their own earnings?

- Bias (reported income) $= 100 \times \frac{\text{Actual Income} - \text{Reported Income}}{\text{Actual Income}}$.
  where Actual Income is taxable income (from Tax Agency).

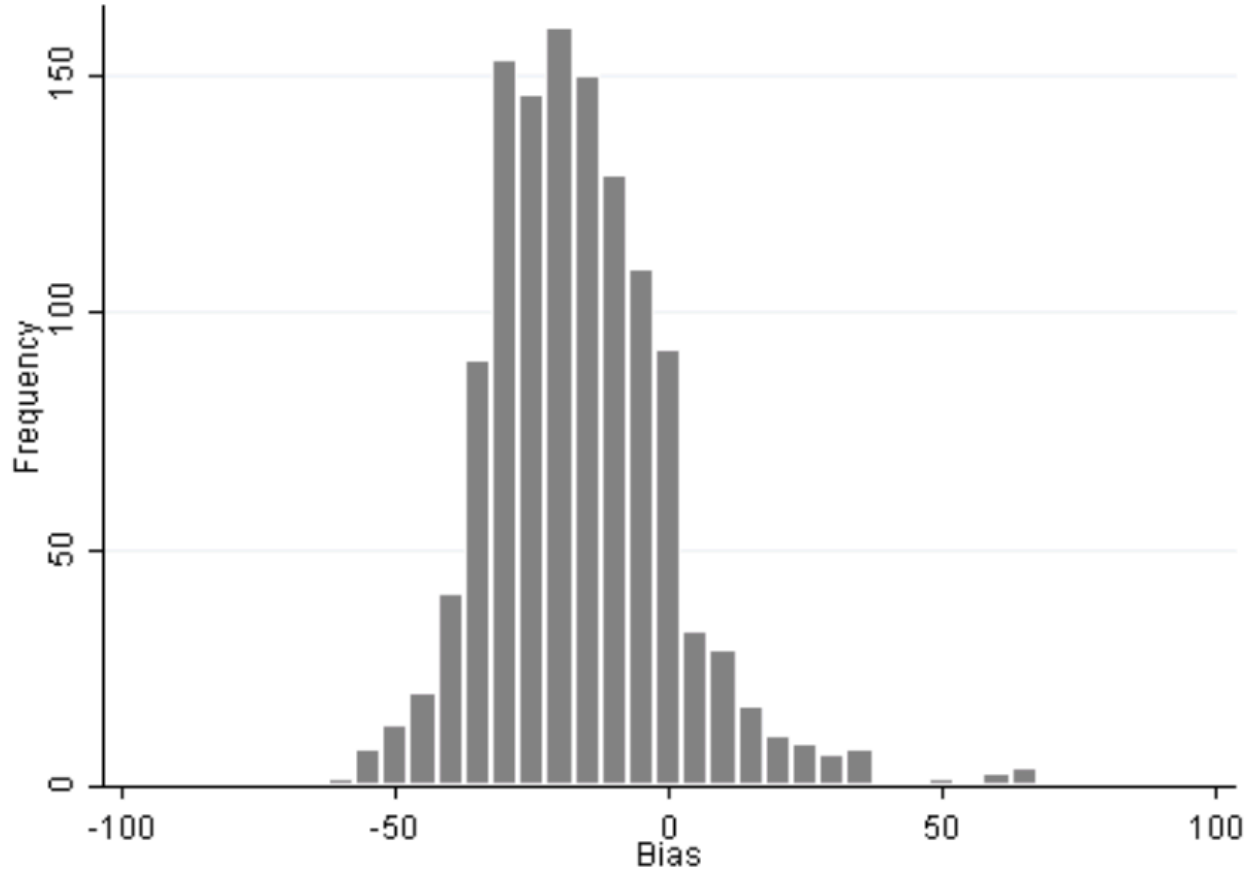


Do they know their location?

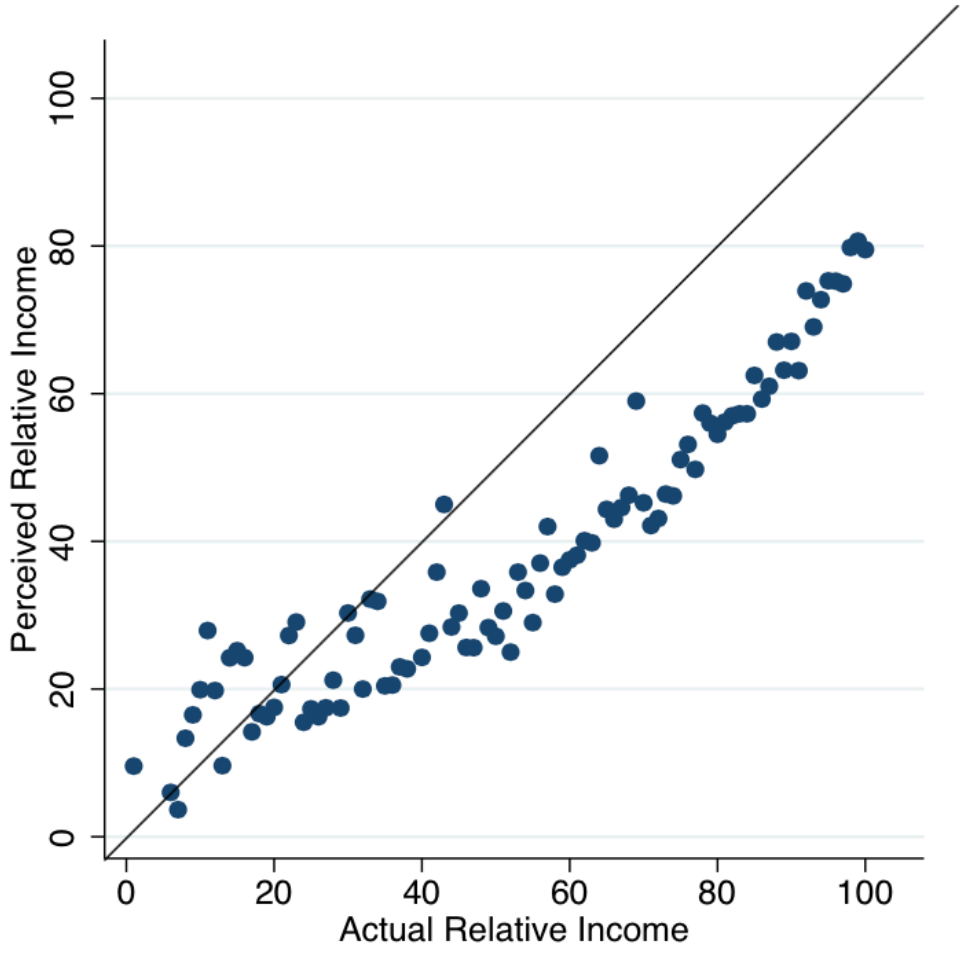
- Define bias $= p_{PER} - p_{ACT}$,

  where

  p_{PER} - perceived position; p_{ACT} - actual position



Is knowledge different over the income-distribution?



Survey 2 - Do these misperceptions matter?

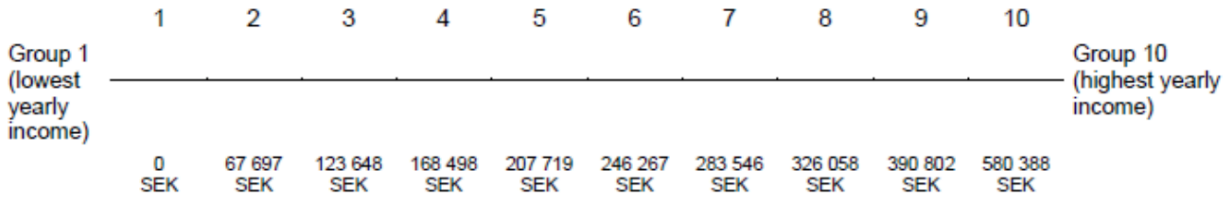
- Three months after Survey 1, we sent out another survey.
- Half of the respondents were randomly given personalized information about actual position – randomization.
- Also asked everyone above:
  - Demand for redistribution
  - Party Preferences
  - Willingness to decrease taxes

Before you answer the questions we want to inform you about the following:

Imagine that we group all Swedes into 10 groups of equal size such that those in group 1 had the lowest yearly income in 2010 and those in group 10 had the highest yearly income. In the figure below, the numbers 1-10 indicate the groups on the scale. Below the numbers, we have reported the yearly income of the person who was in the middle of that group.

In the previous survey you reported a yearly income for 2010 of X SEK.
In the figure below we have indicated where you income is located on the scale.

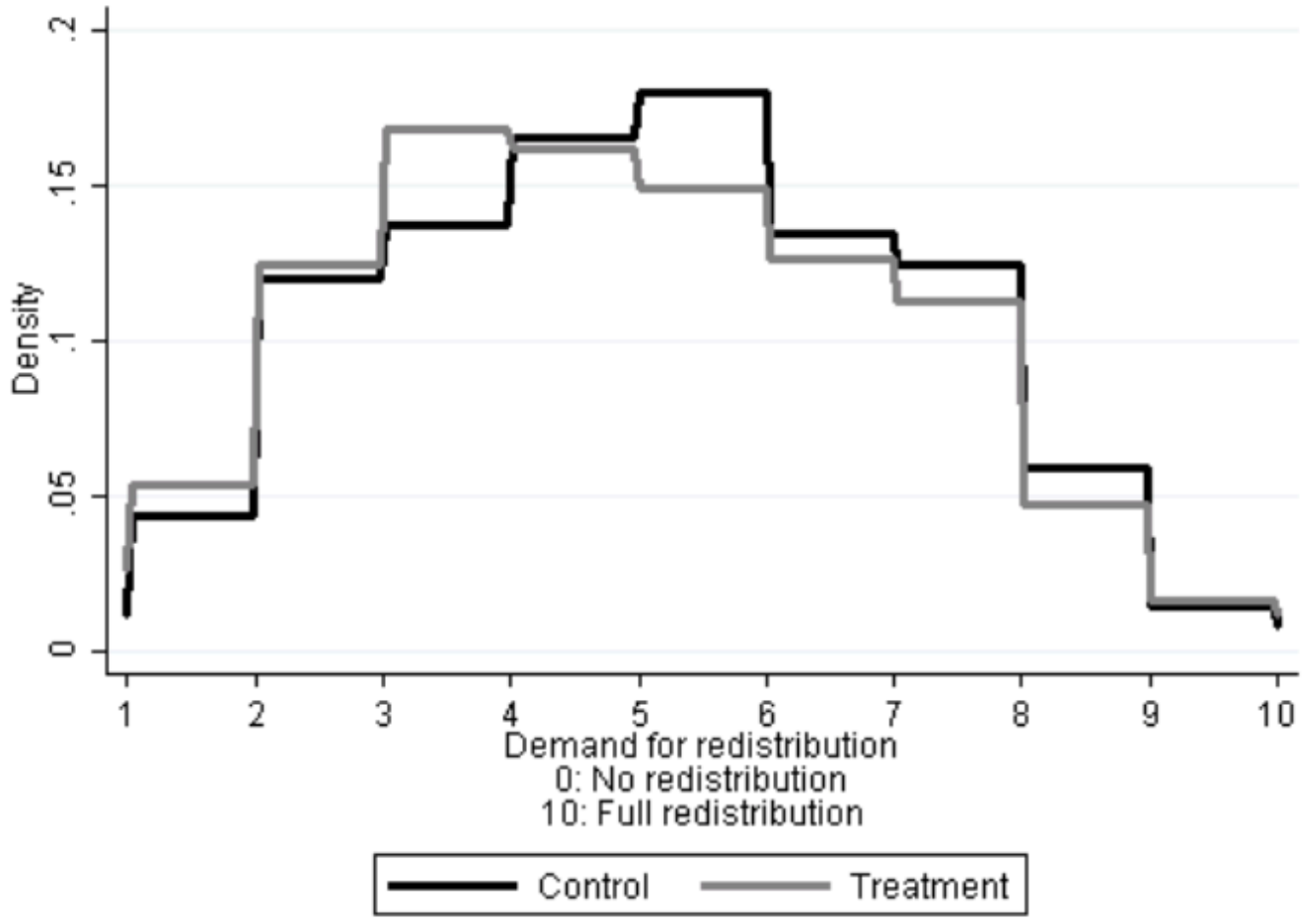
.

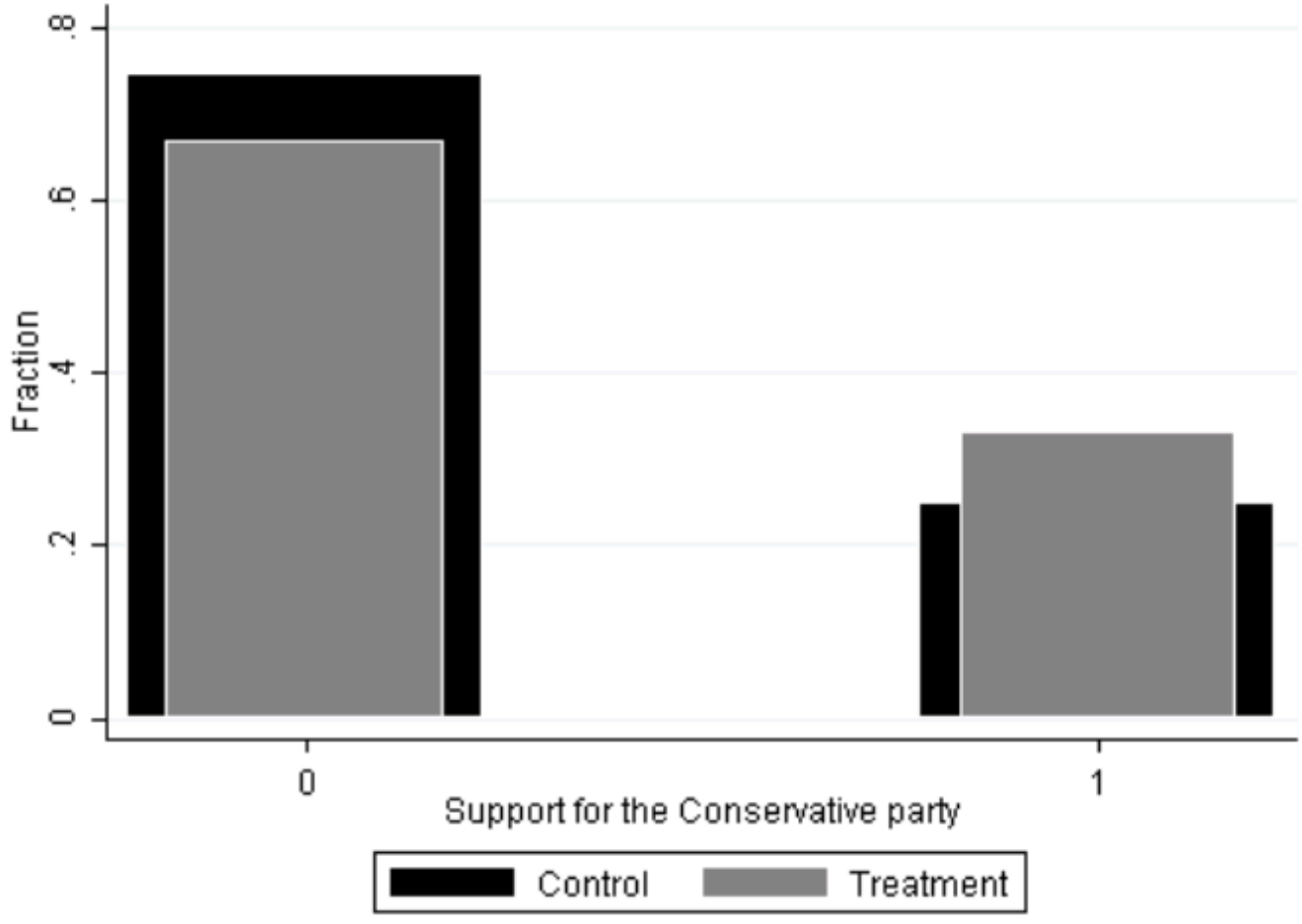


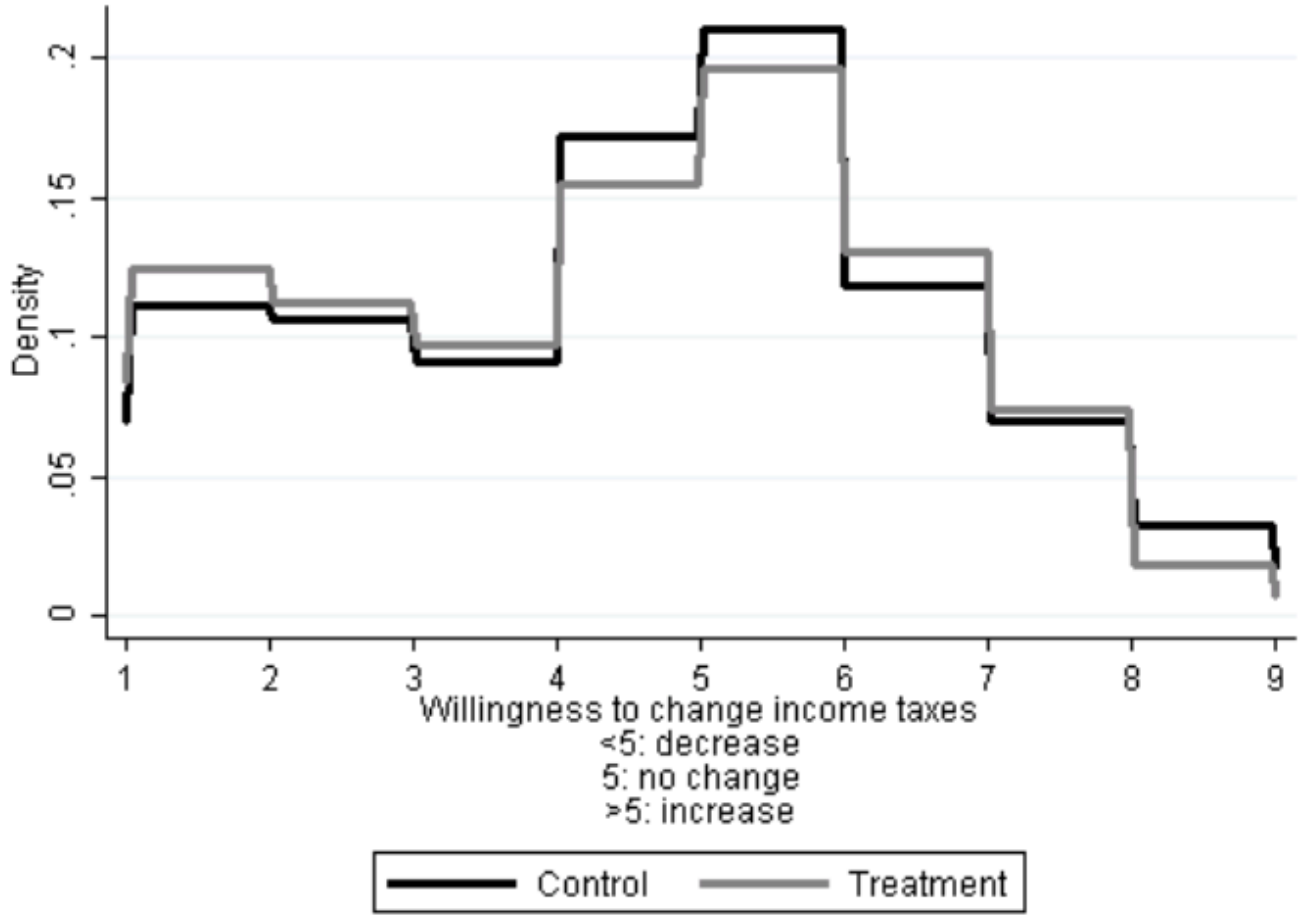
By income we mean total yearly income, defined as wage and capital income before taxes. Pensions before taxes are also included. Student stipends and other transfers such as unemployment transfers from the government are not included in total yearly income. The income statistics come from Statistics Sweden and are based on the whole Swedish population above age 18.

- About 80 % response rate b/w first and second survey.
- No selective attrition based on treatment.

Graphical illustration for those with $bias < -10$.




Fraction
0
.2
.4
.6
.8
0
1
Support for the Conservative party
Control
Treatment


Density
0
.05
.1
.15
.2
1
2
3
4
5
6
7
8
9
Willingness to change income taxes
<5: decrease
5: no change
>5: increase
Control
Treatment

Average Effects

	(1) Outcome Index	(2) Against-Redist	(3) Cons. party	(4) Decrease tax
Treated×Neg. Bias	0.134**	0.078**	0.081**	0.040
	(0.057)	(0.037)	(0.037)	(0.038)
No bias	-0.007	-0.002	-0.018	0.024
	(0.072)	(0.049)	(0.050)	(0.051)
Treated×No Bias	-0.066	-0.054	-0.013	-0.023
	(0.085)	(0.059)	(0.056)	(0.062)
Pos. bias	-0.059	-0.120	0.117	0.013
	(0.152)	(0.089)	(0.114)	(0.104)
Treated×Pos. Bias	0.140	0.160	-0.068	-0.003
	(0.193)	(0.124)	(0.139)	(0.136)
Constant	-0.030	0.360***	0.251***	0.404***
	(0.039)	(0.026)	(0.027)	(0.027)
Obs	1001	1001	872	985

Heterogeneity by Right

	(1) Index	(2) Index	(3) Index	(4) Index
Treated	-0.194***	-0.054	0.018	0.087
	(0.049)	(0.055)	(0.064)	(0.065)
Treated×Right		-0.339***		-0.177
		(0.104)		(0.149)
Treated×Bias			0.009**	0.002
			(0.004)	(0.004)
Bias			-0.004	-0.002
			(0.003)	(0.003)
T×Bias×Right				0.017**
				(0.008)
Bias×Right				-0.006
				(0.006)
Controls	Yes	Yes	Yes	Yes
Obs	678	678	743	743

Conclusion

- Majority have a large bias; believe that they are poorer than they are.
- Correcting misinformation leads to lower demand for redistribution.
- Effects driven by prior right-wing respondents
- Suggests more polarization of political beliefs in Sweden.
- How would the results generalize to other countries, e.g. USA?

How much wealth inequality is due to inheritances?

- Other factors (already discussed):
  1. Heterogeneity in self-made wealth (labor income)
  2. Heterogeneity in rate of return.
- Old question
- 1980s debate (b/w Kotlikoff-Summers and Modigliani) about the share of total wealth that was due to inheritances.

- **Policy relevance:**
- Use labor income or inheritance taxes to reduce wealth inequality
- Tax inherited and self-made wealth differently.
- Addressed in Nekoei and Seim (2021).

Nekoei and Seim (2021): Research Design

- What is the **effect of inheritances** on wealth inequality? **Causal question.**
- What do heirs do with inherited wealth? Do they invest it or do the consume it?
- Is there a difference in responses based on baseline wealth? E.g. do heirs **who already are wealthy** behave differently when receiving inheritances?

Nekoei and Seim (2021): Research Design

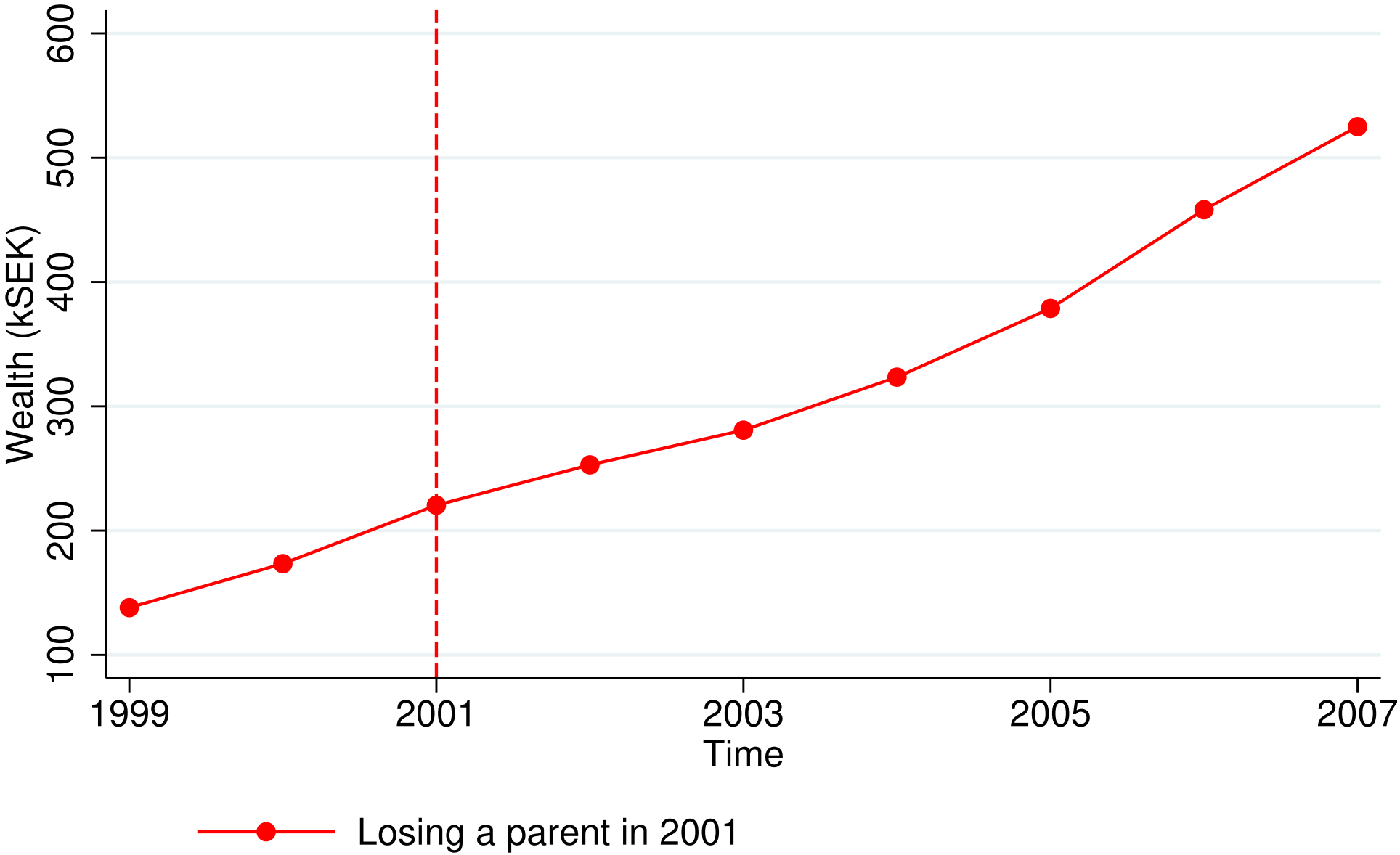
- **Our approach:**

1. Compare wealth before and after inheritance receipt.
2. Add a control group and construct a **Difference-in-differences estimator**.

   Idea: compare heirs who receive inheritances earlier with those receiving later.
   - Key assumption: timing of inheritances is random within a few years.

- Assumption is **testable**. If it holds, outcomes of heirs who receive inheritance early and late should move in parallell until early-receipients receive.

Empirical Design



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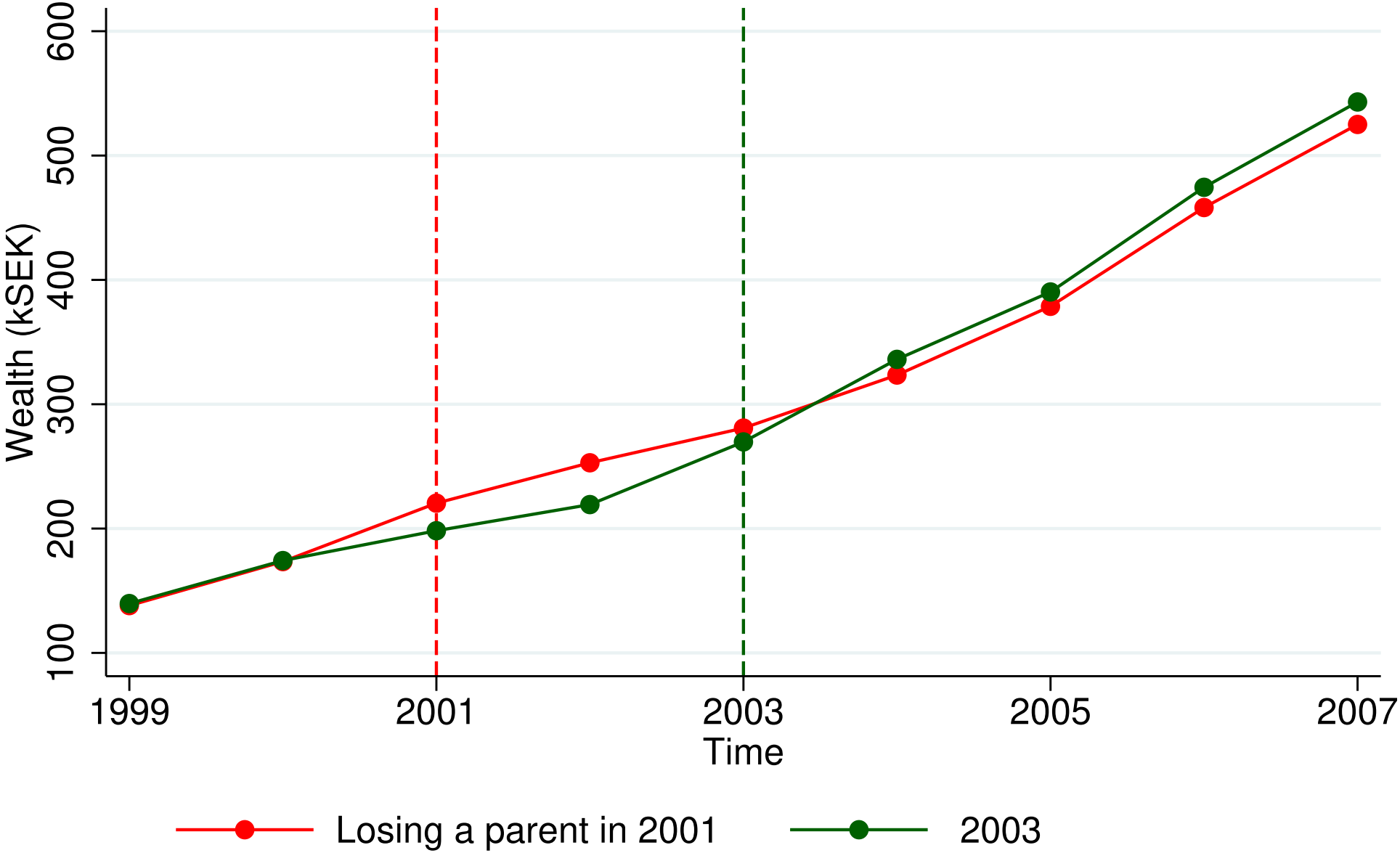

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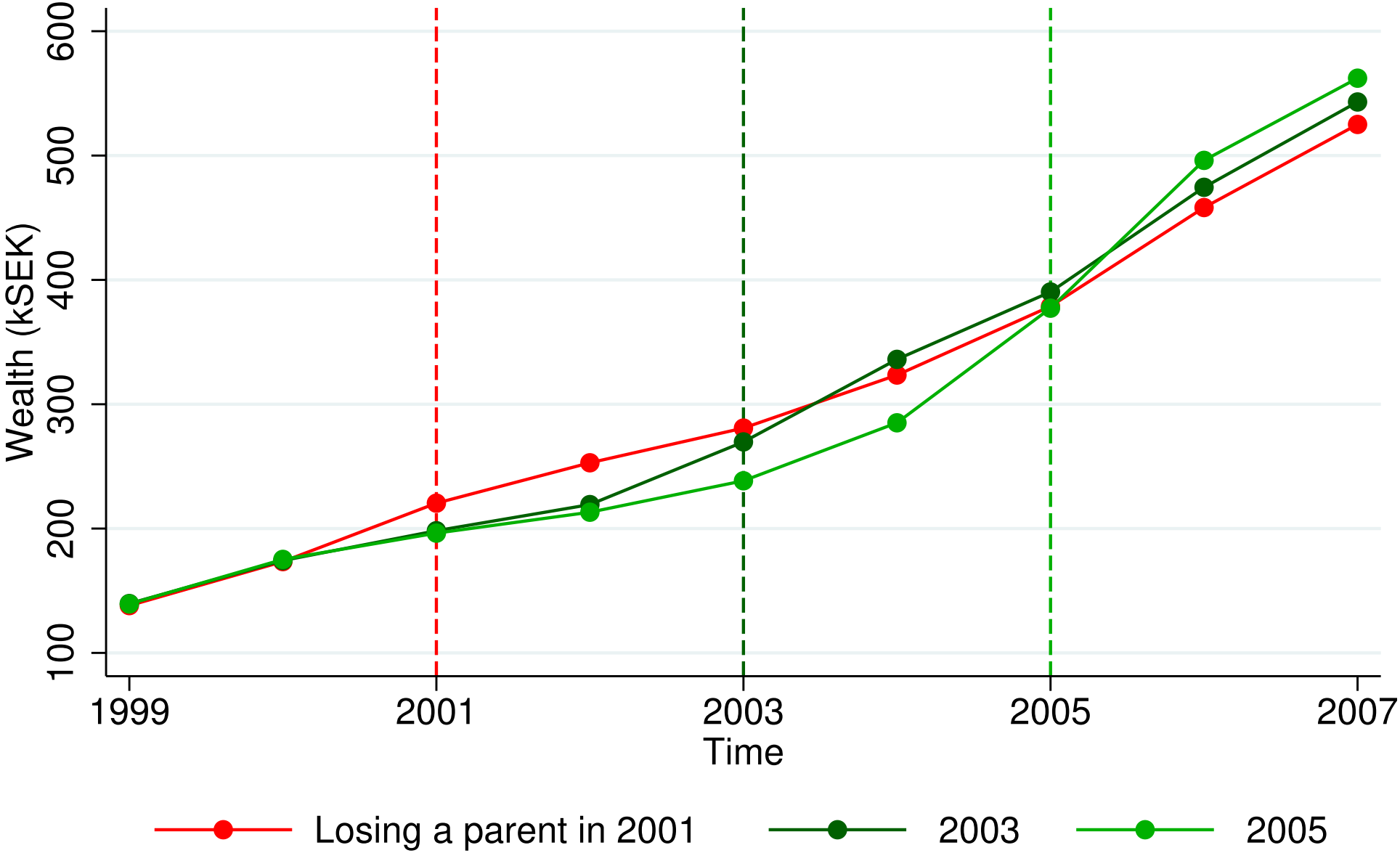

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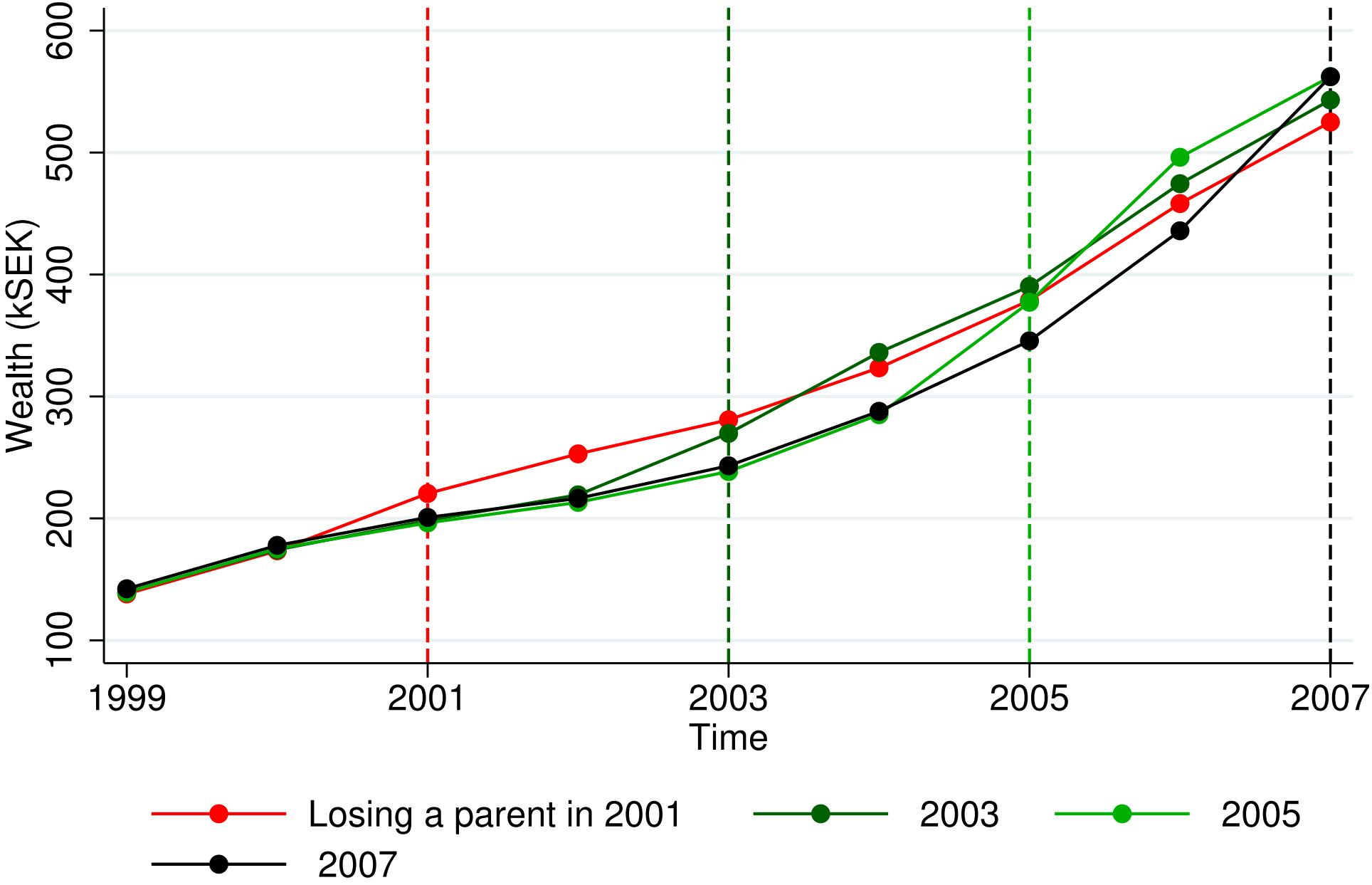

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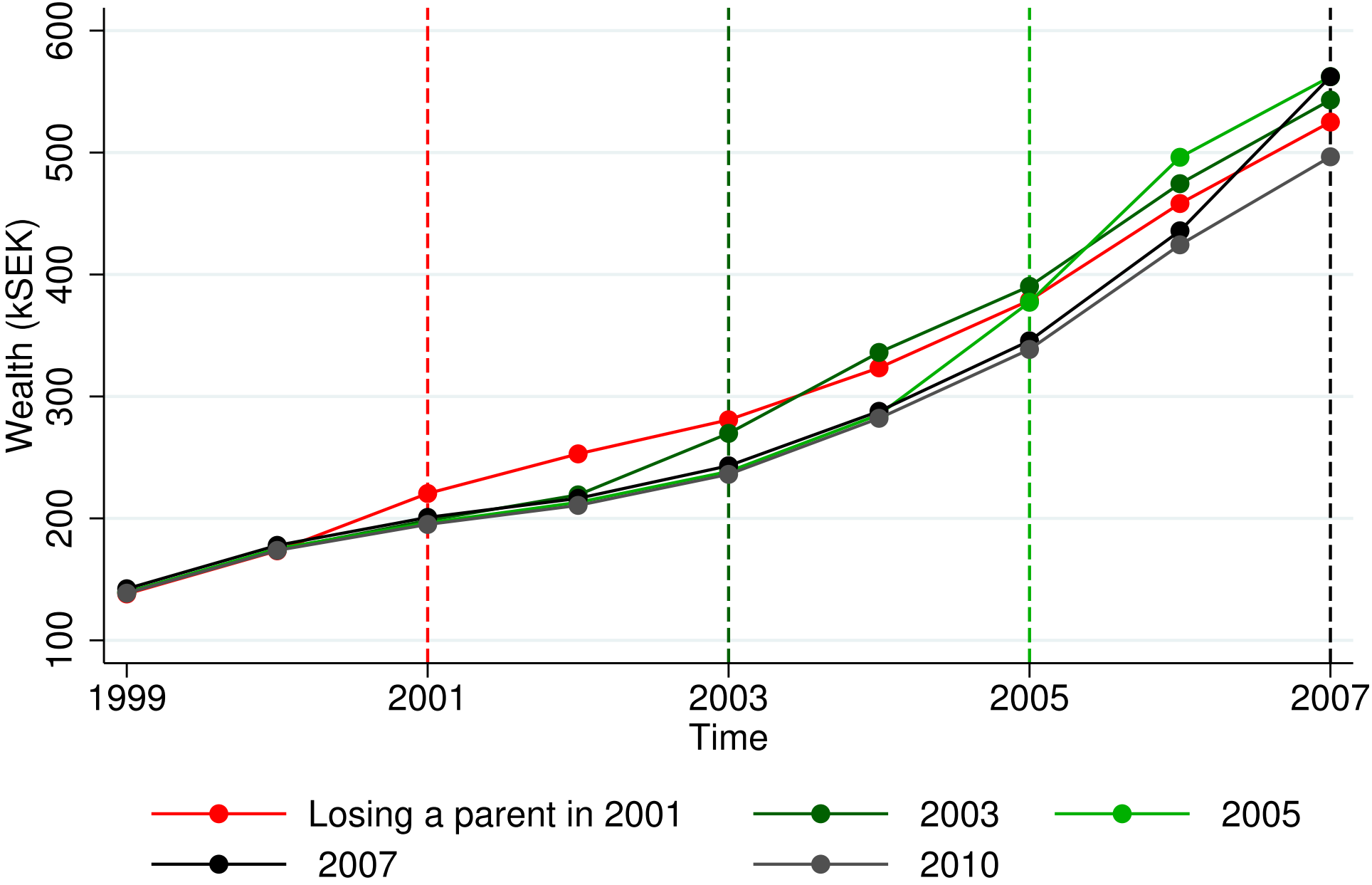
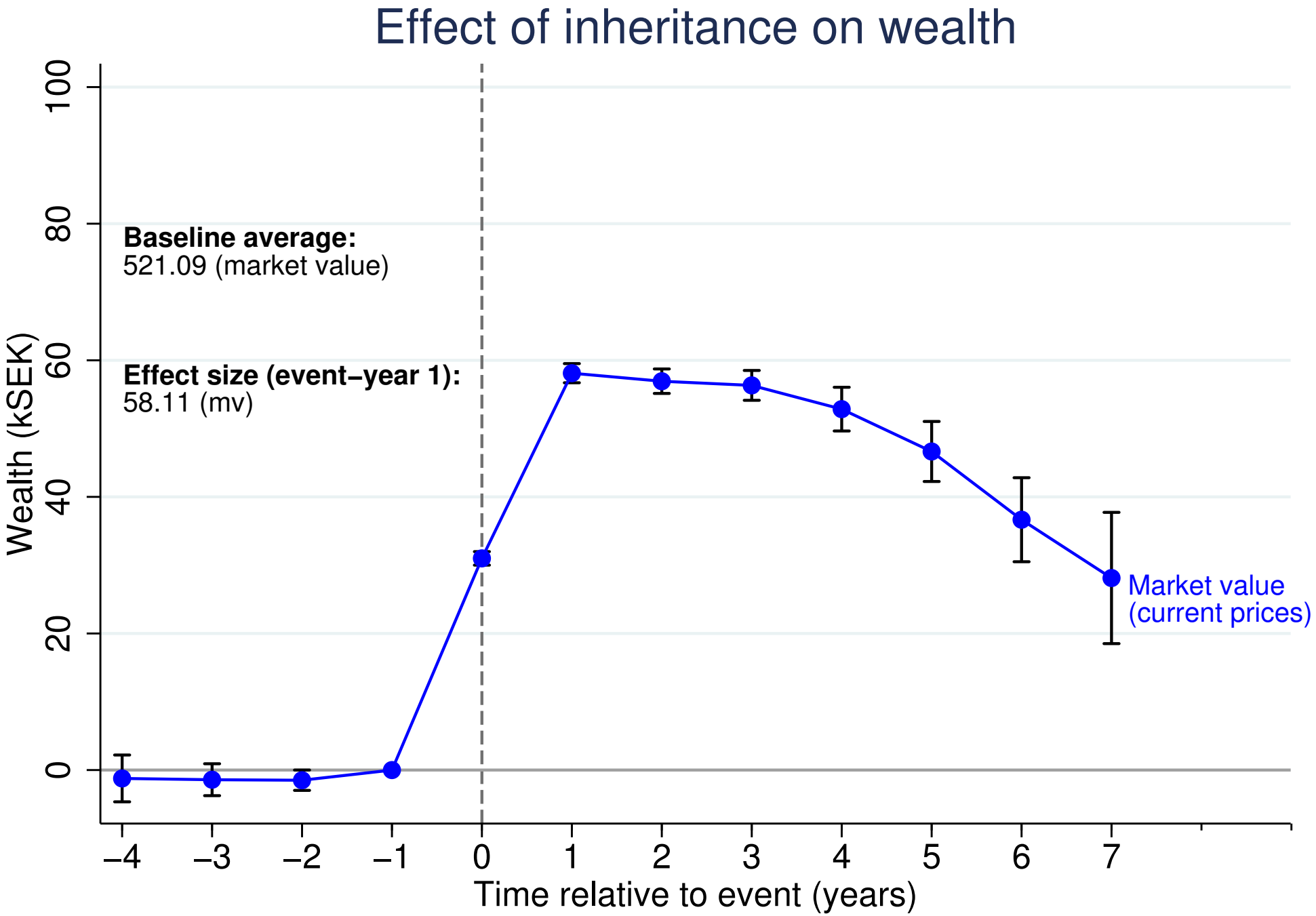


Research design conclusions

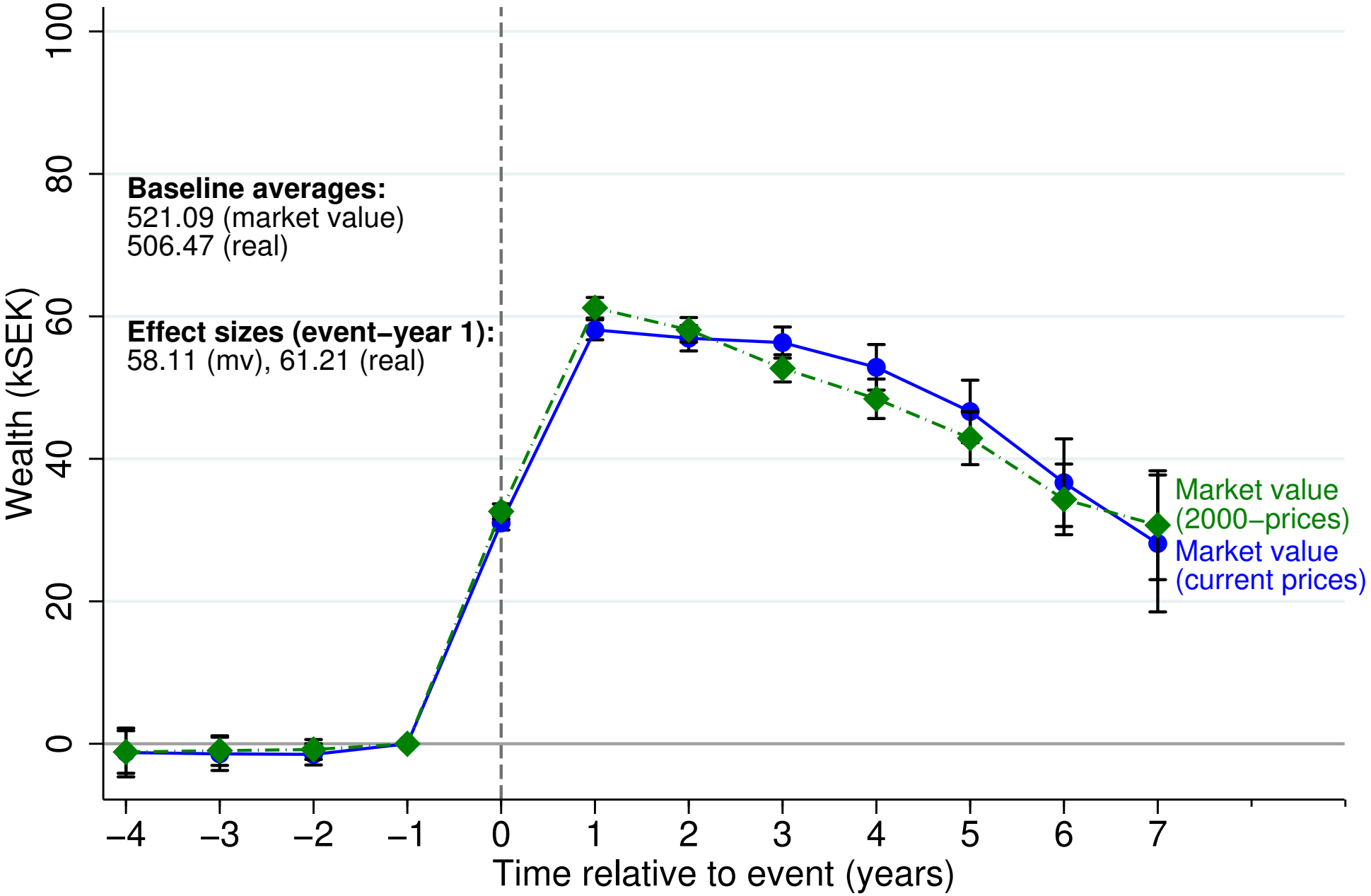
- Conclusion: Design is invariant to comparisons of heirs receiving inheritances 2, 4, 6 and even 9 years apart.
- Advantage of more years apart: Can estimate long-run effect.
- Disdvantage of more years apart: potential violation of parallell pre-trend assumption.
- How do we go from this to measure effects?

  $\Rightarrow$

  1. Choose years apart
  2. Calculate **vertical difference** between control and treatment group
  3. Normalize the x-axis to be centered around the exact time of inheritance receipt (x = year - inheritance-year).


Effect of inheritance on wealth
Wealth (kSEK)
0
20
40
60
80
100
Baseline average:
521.09 (market value)
Effect size (event−year 1):
58.11 (mv)
Market value
(current prices)
−4
−3
−2
−1
0
1
2
3
4
5
6
7
Time relative to event (years)

Effect of inheritance on wealth



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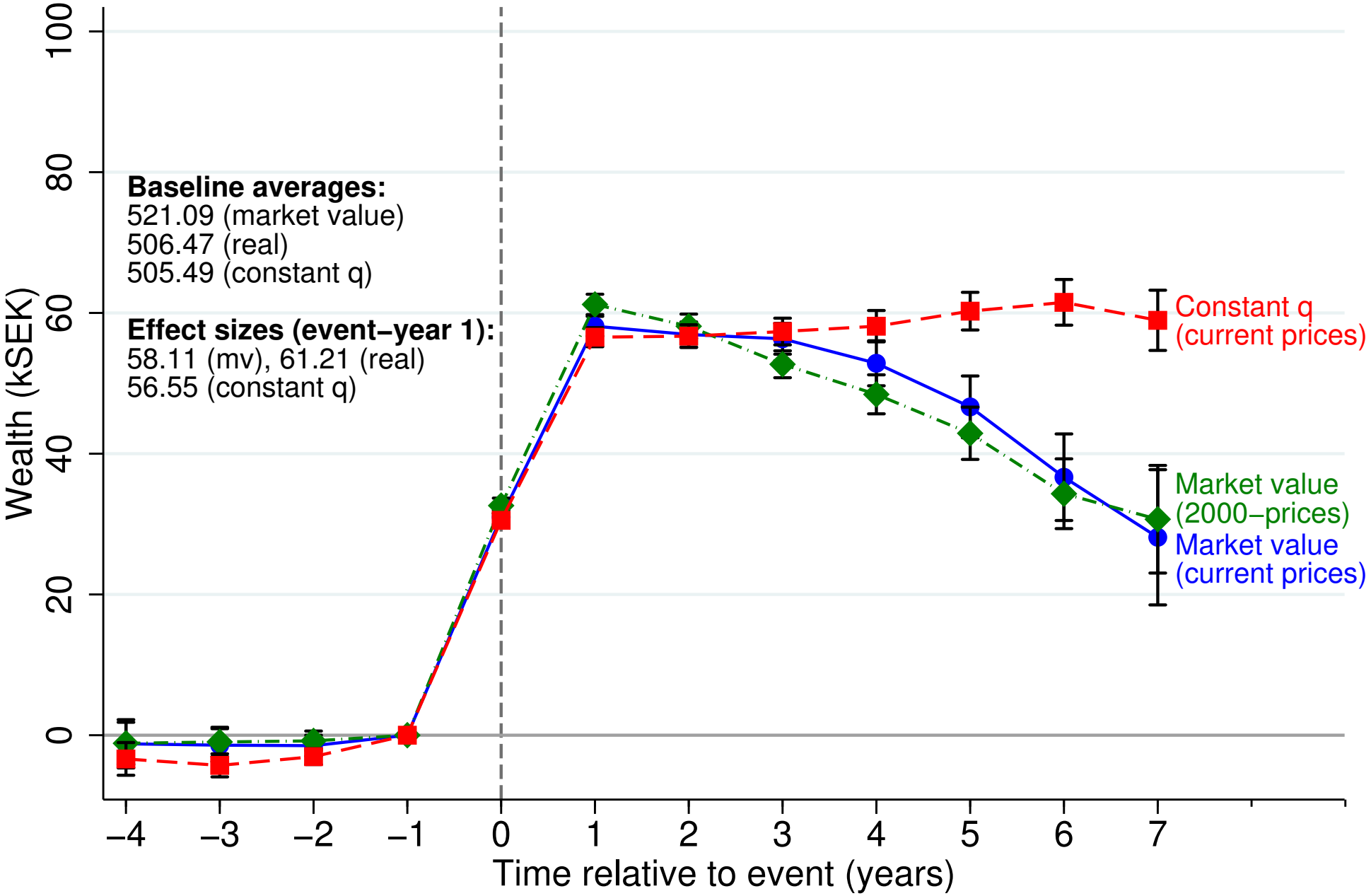
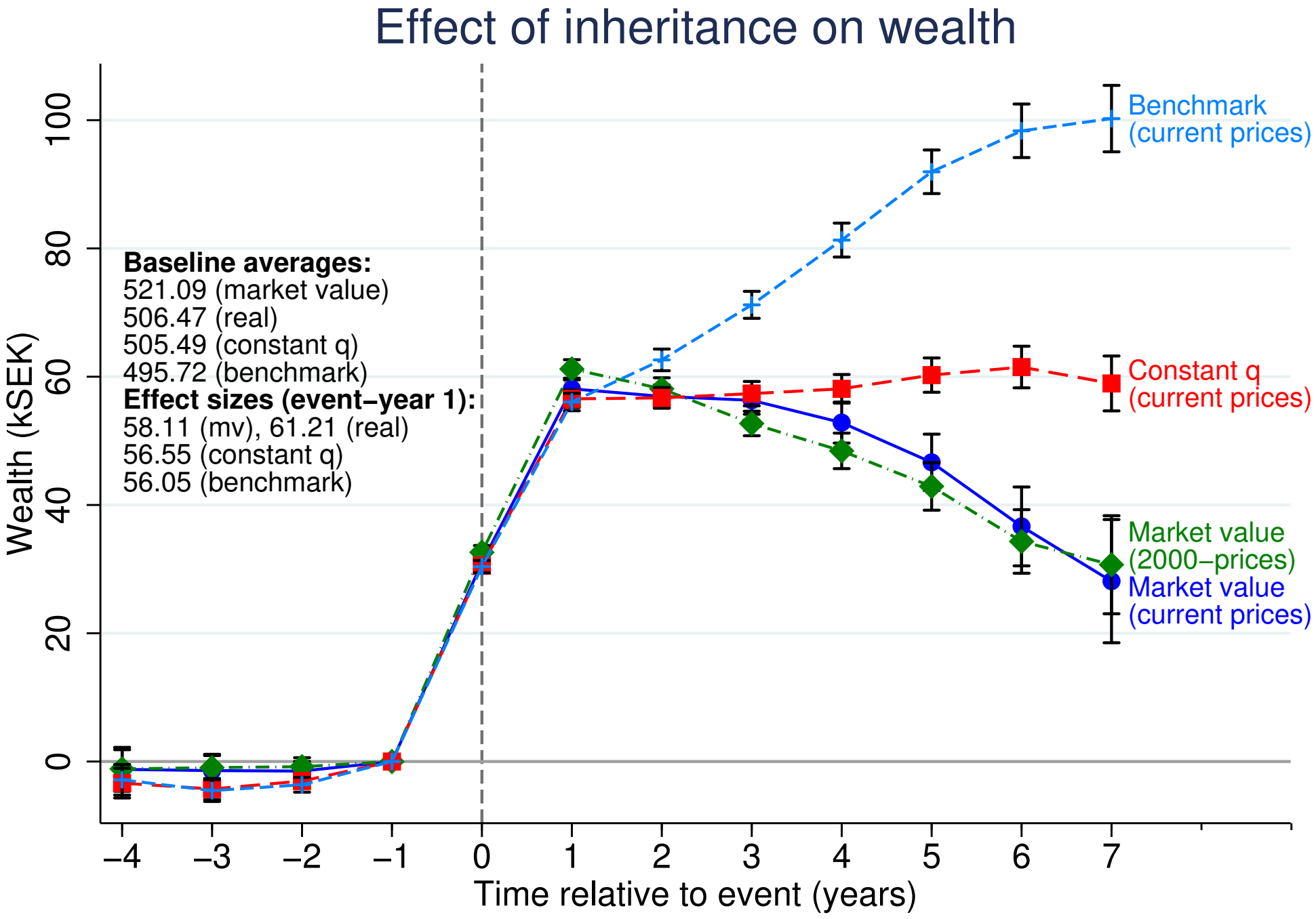
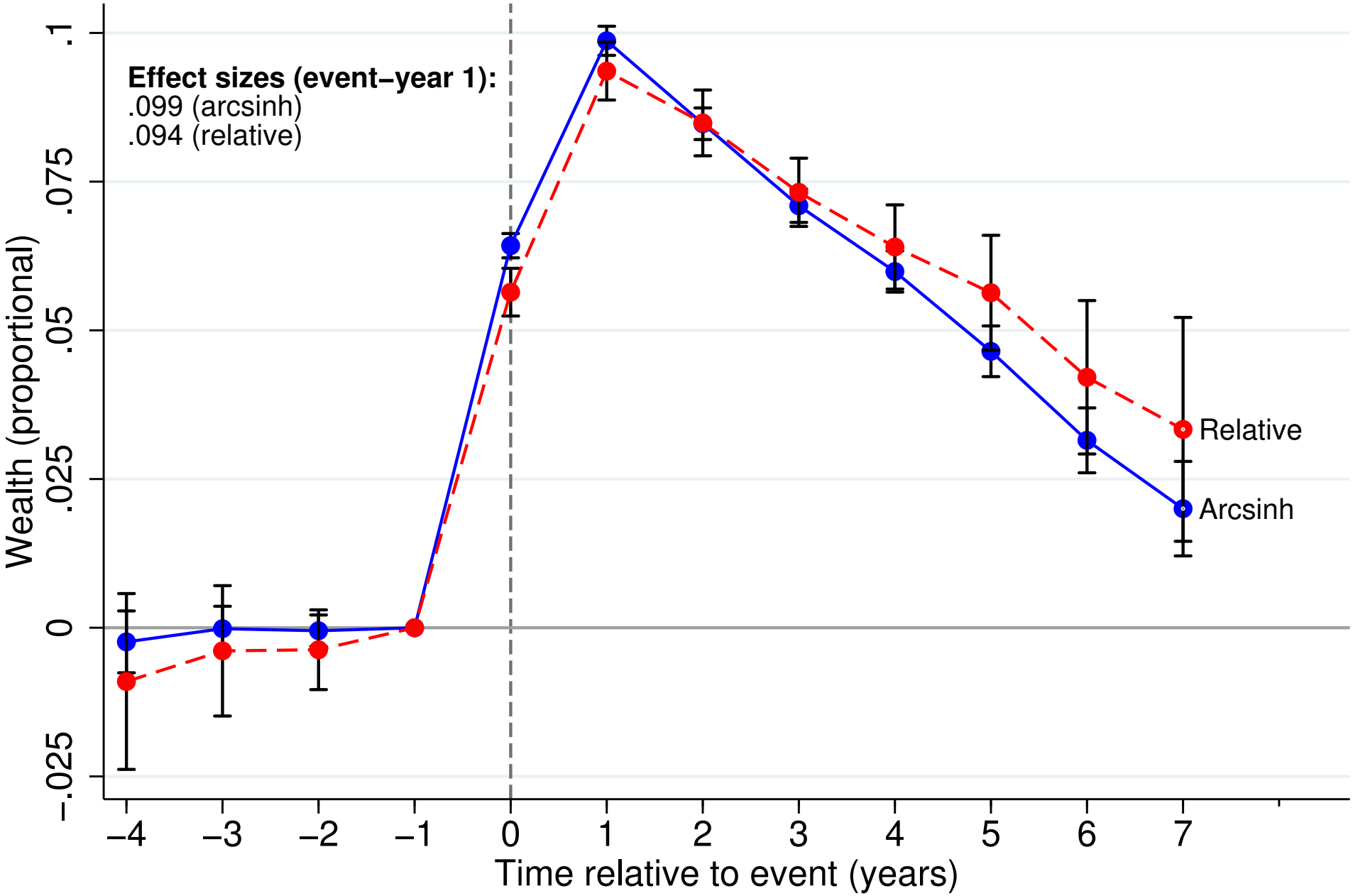
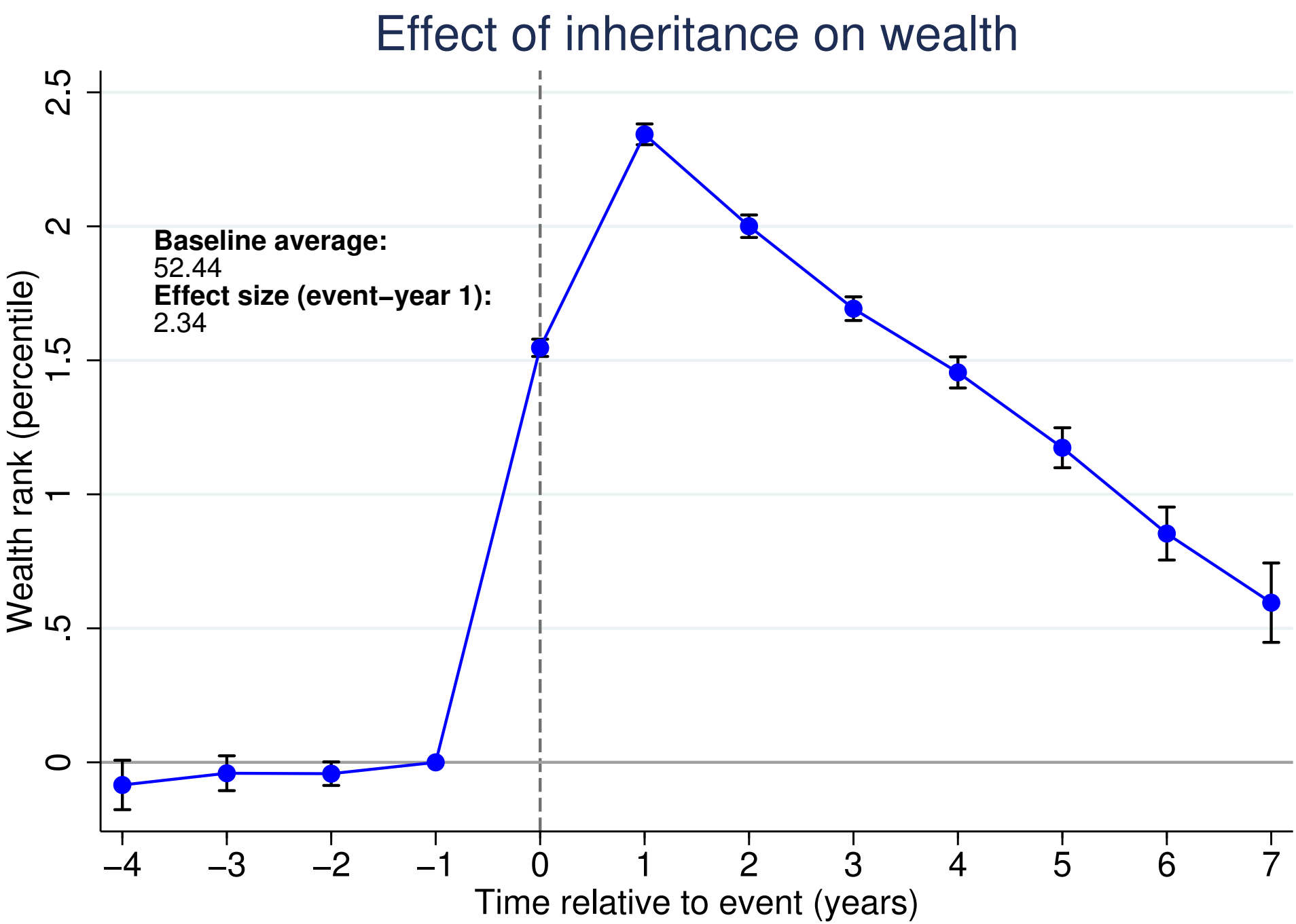



Effect of inheritance on wealth
Wealth (kSEK)
0
20
40
60
80
100
−4
−3
−2
−1
0
1
2
3
4
5
6
7
Time relative to event (years)
Baseline averages:
521.09 (market value)
506.47 (real)
505.49 (constant q)
495.72 (benchmark)
Effect sizes (event−year 1):
58.11 (mv), 61.21 (real)
56.55 (constant q)
56.05 (benchmark)
Benchmark
(current prices)
Constant q
(current prices)
Market value
(2000−prices)
Market value
(current prices)

Effect of inheritance on wealth




Effect of inheritance on wealth
Baseline average:
52.44
Effect size (event−year 1):
2.34
Wealth rank (percentile)
0
.5
1
1.5
2
2.5
−4
−3
−2
−1
0
1
2
3
4
5
6
7
Time relative to event (years)

Effects for the average heir

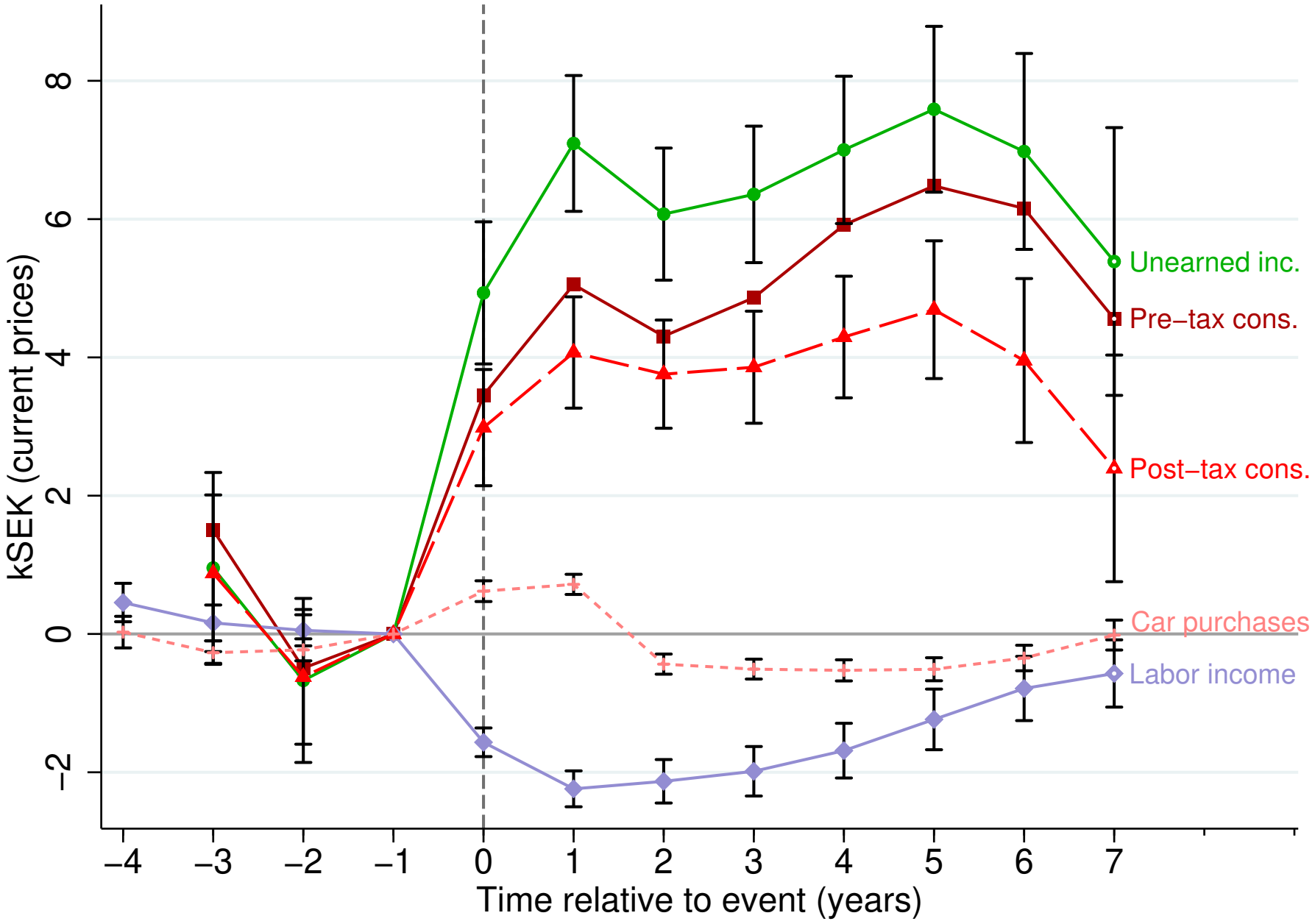
1. Inheritances increase heirs' wealth by 58,000 SEK.

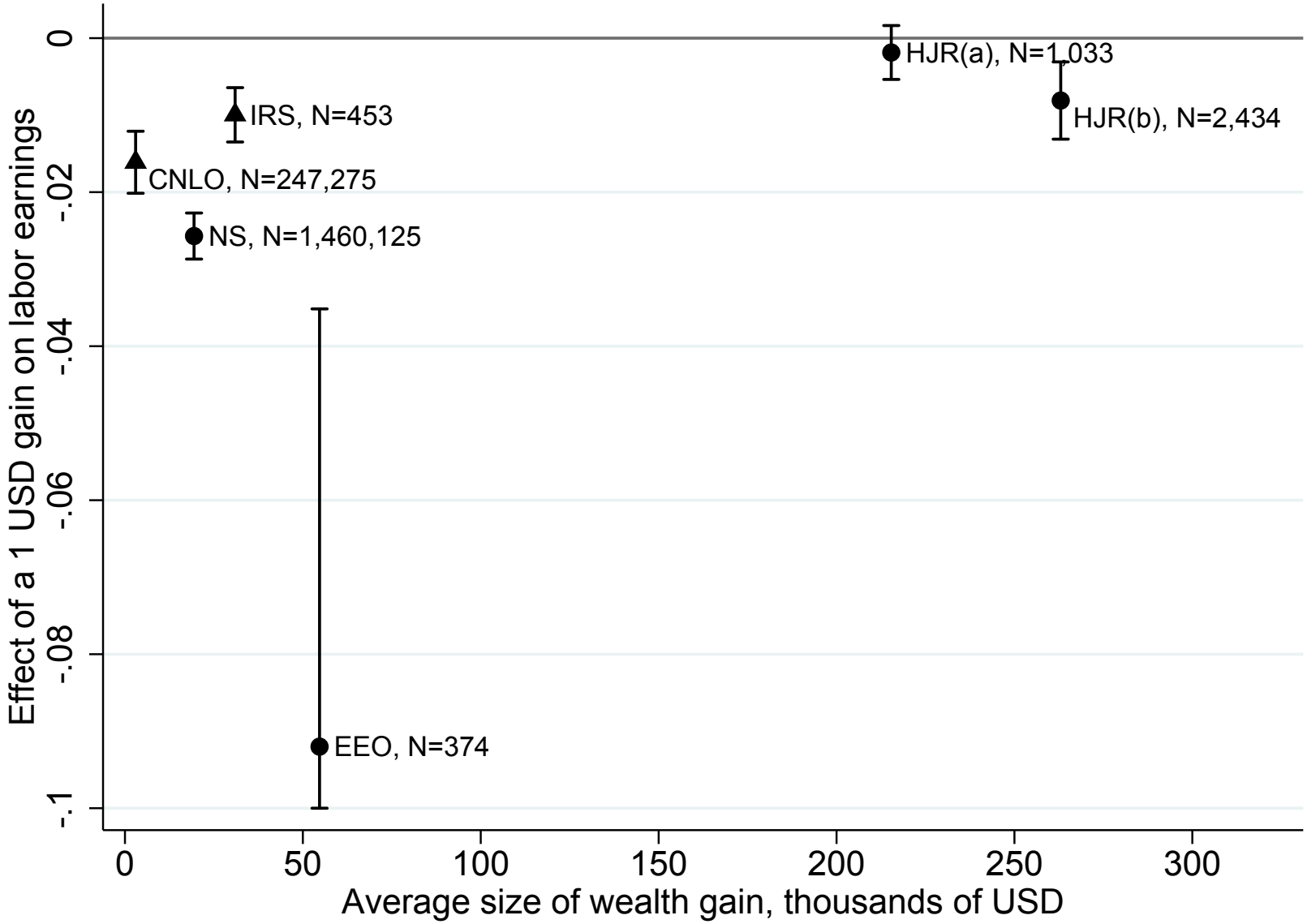
- Equivalent to:
  - 10% increase in wealth;
  - 30% of average labor income;
  - 2.3 percentile-increase in rank.

2. Behavioral responses $\Rightarrow$ **strong depletion**.

   7 years after inheritances: 28,000 SEK is left.

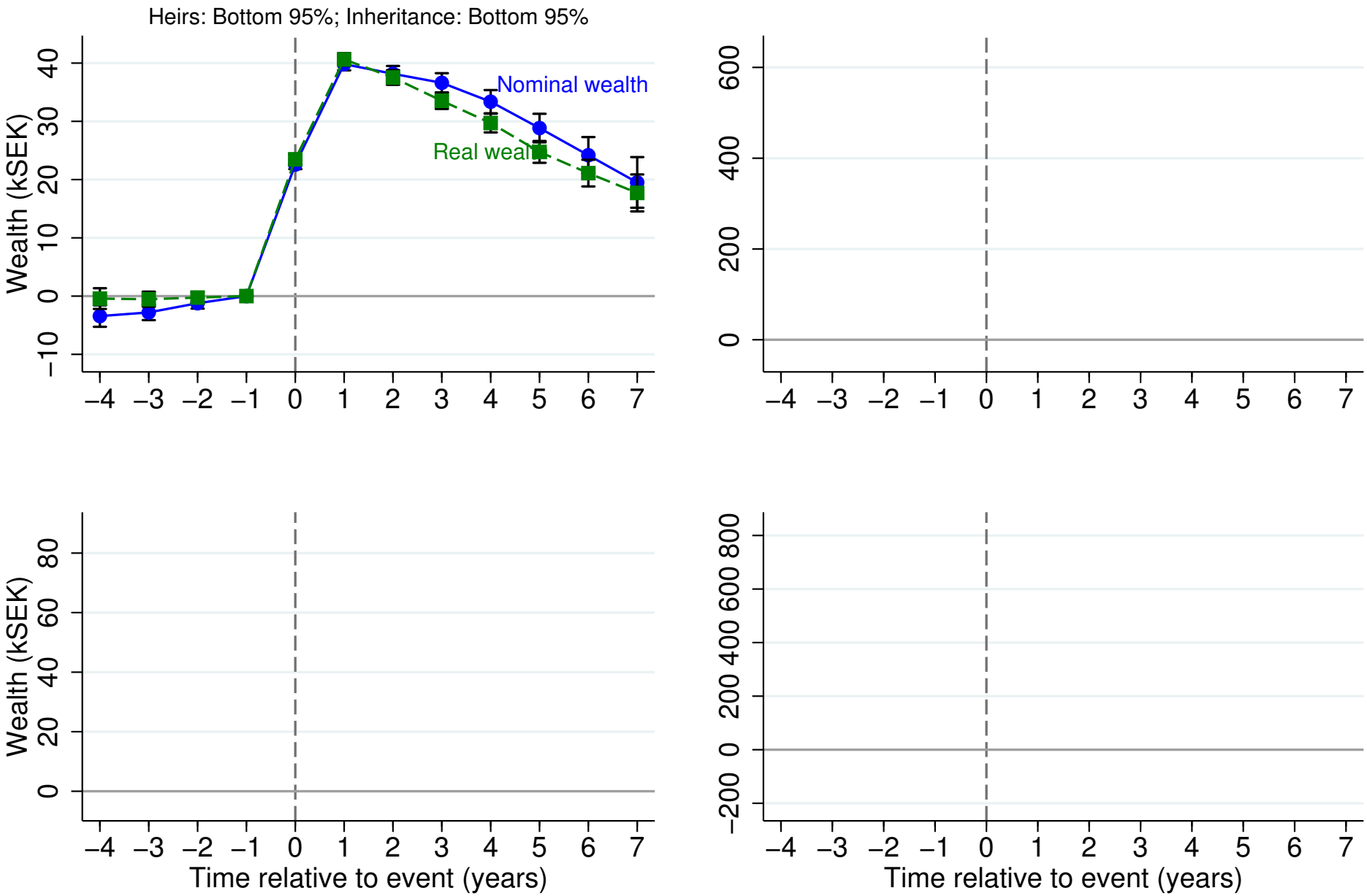
- First, what do they spend their inheritances on?


kSEK (current prices)
8
6
4
2
0
−2
−4
−3
−2
−1
0
1
2
3
4
5
6
7
Time relative to event (years)
Unearned inc.
Pre−tax cons.
Post−tax cons.
Car purchases
Labor income



- To understand the implications for inequality, investigate **effects for various subgroups**.

Heterogeneity by initial wealth and inheritance



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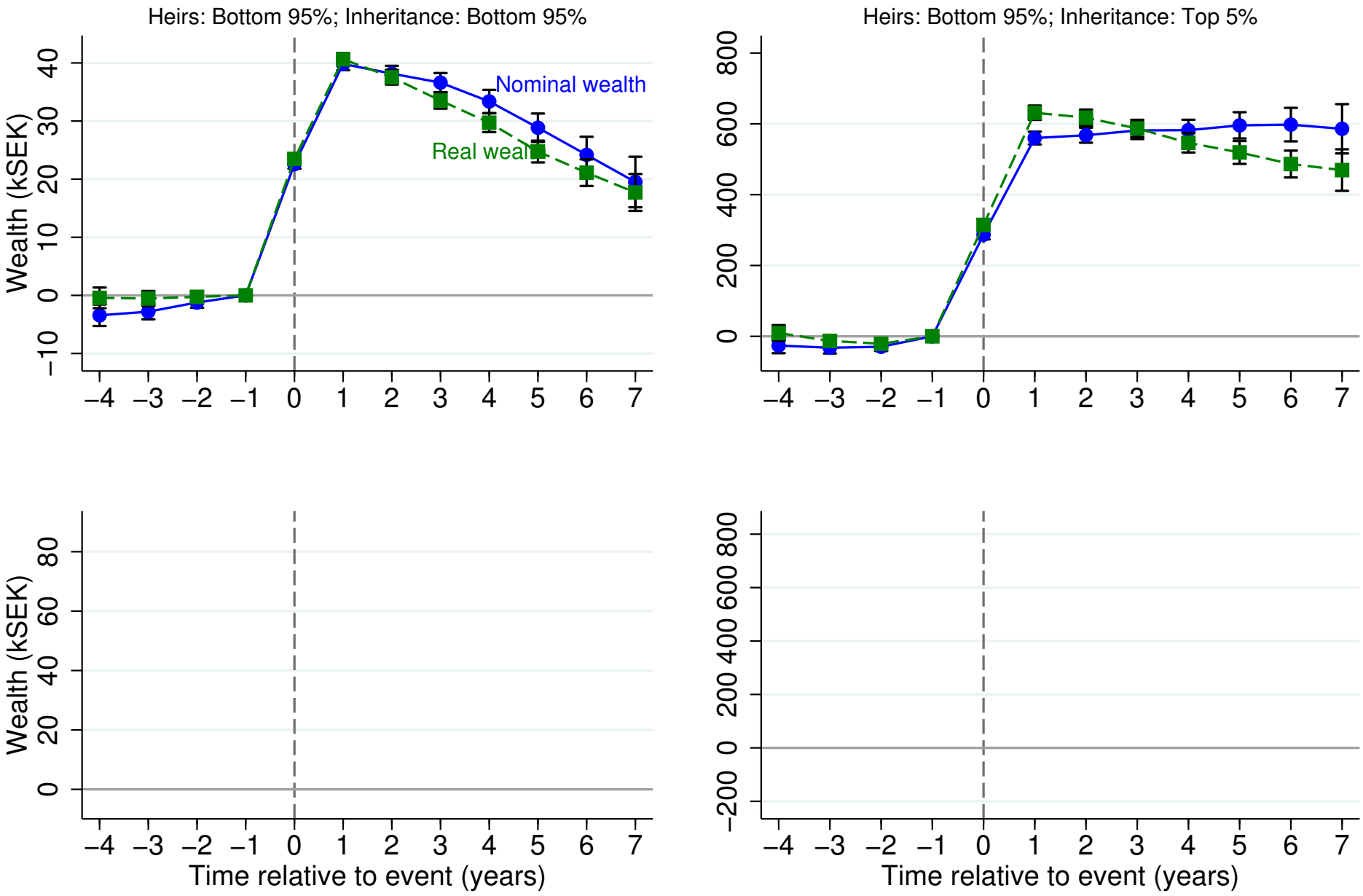

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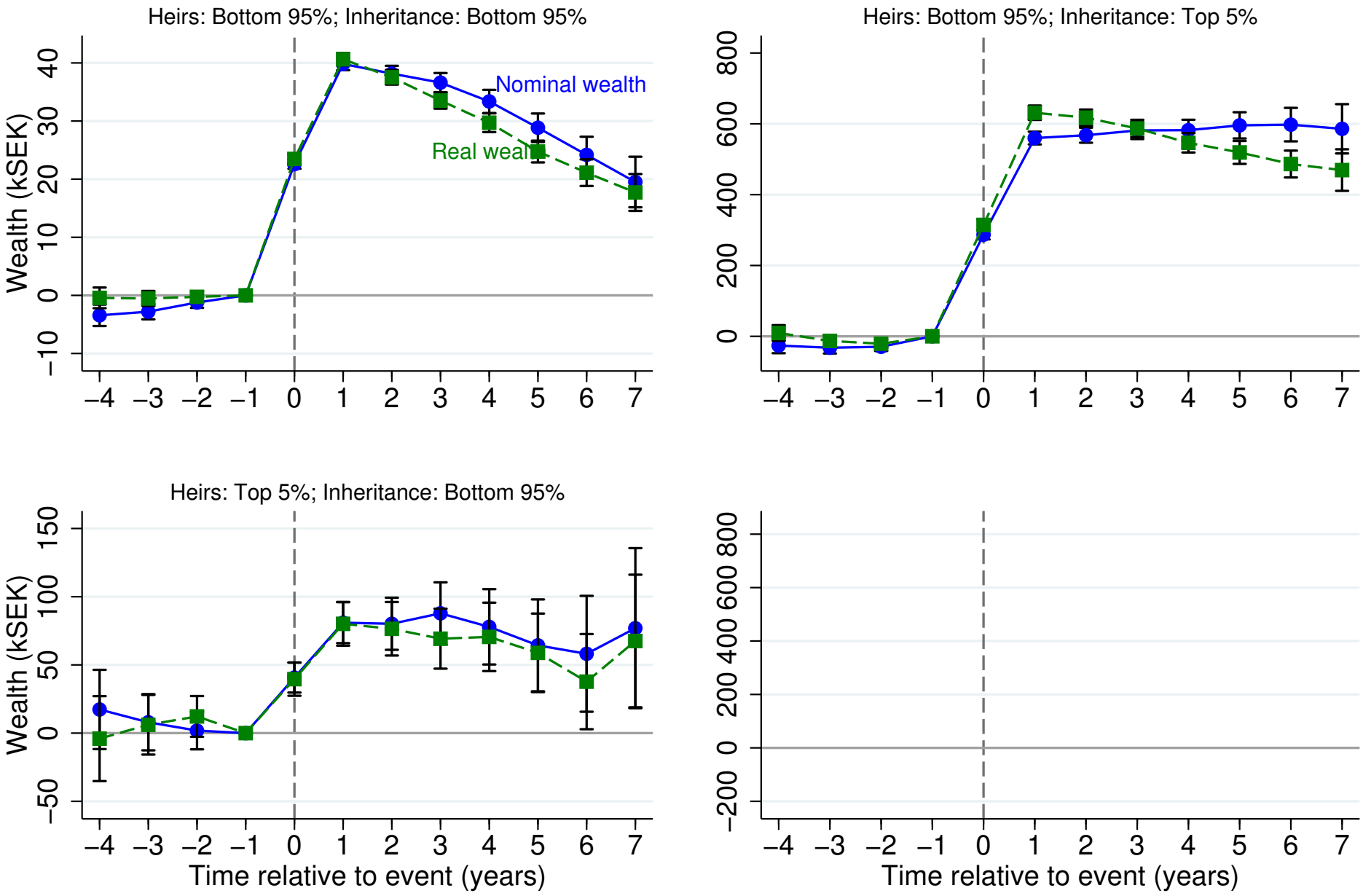
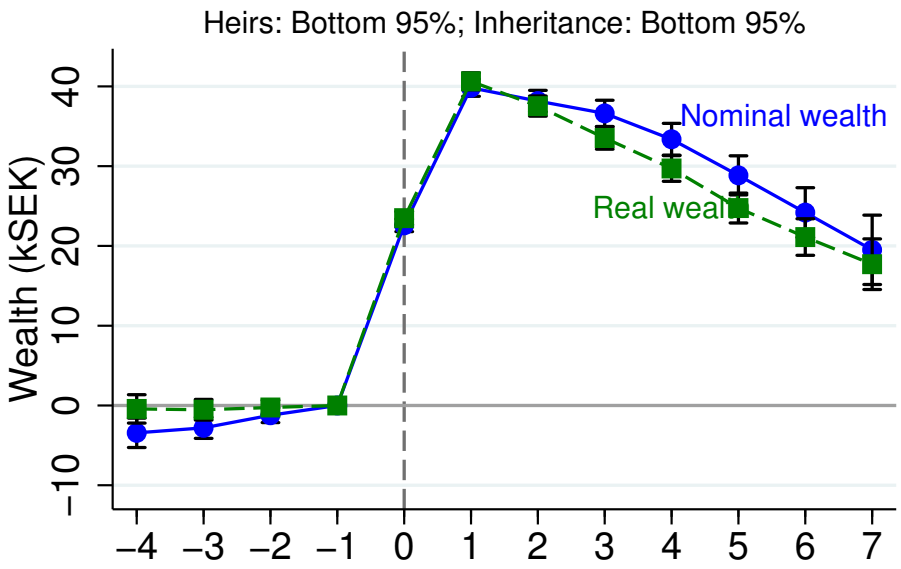
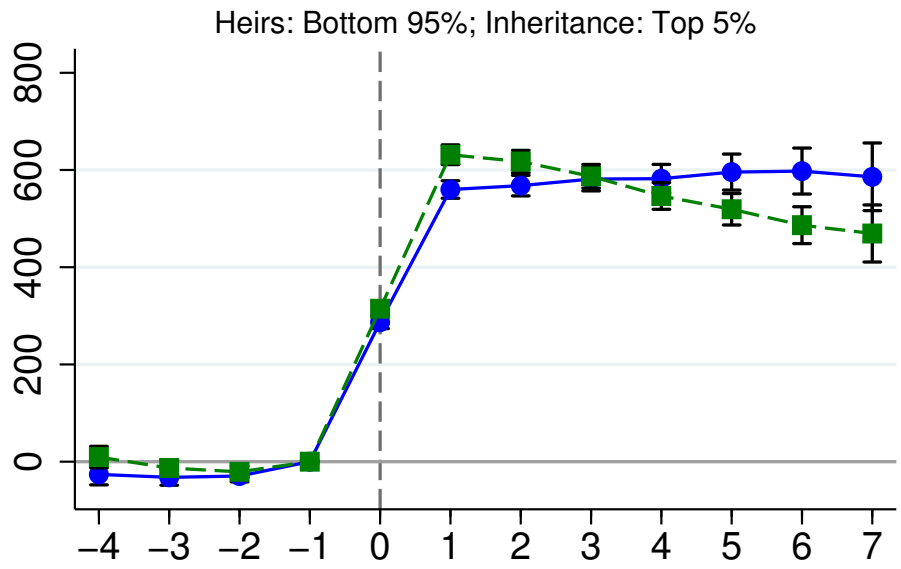
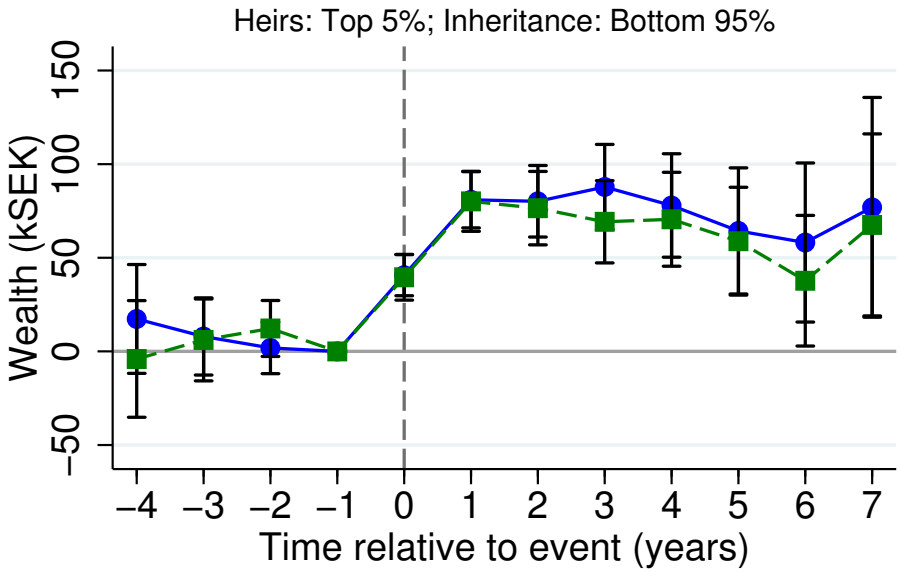
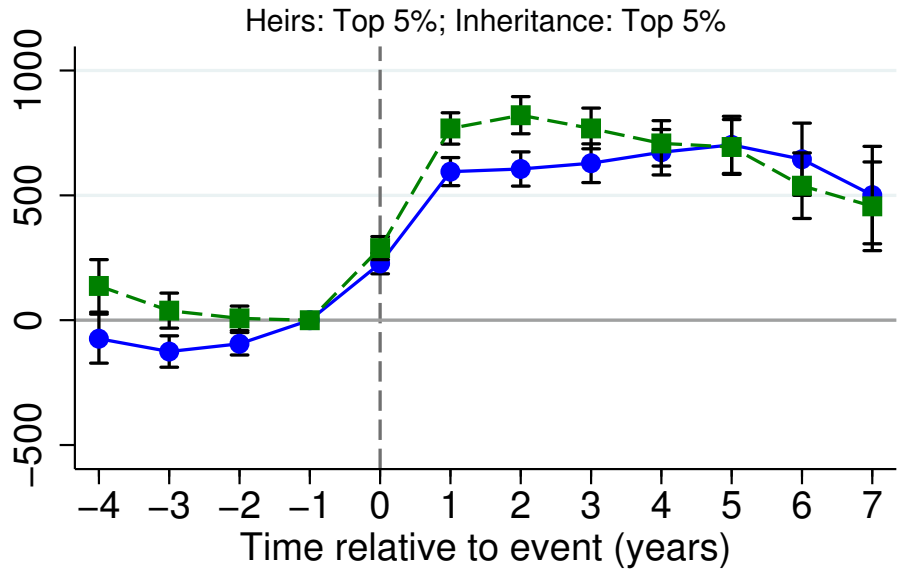


Heterogeneity by initial wealth and inheritance

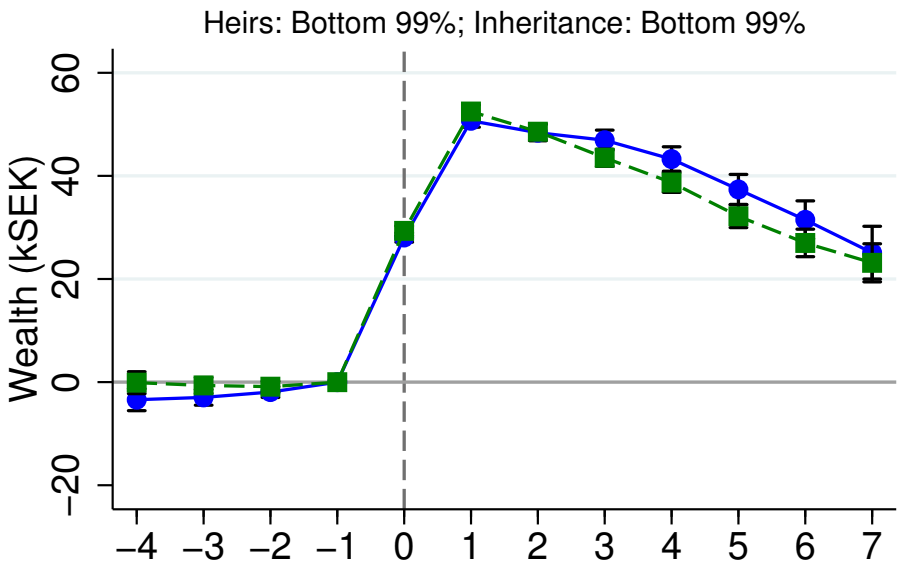


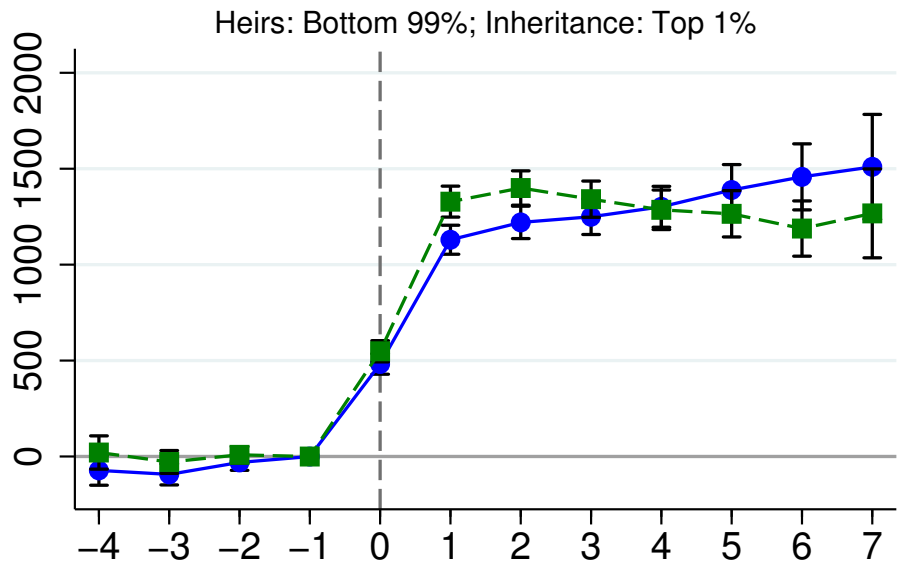


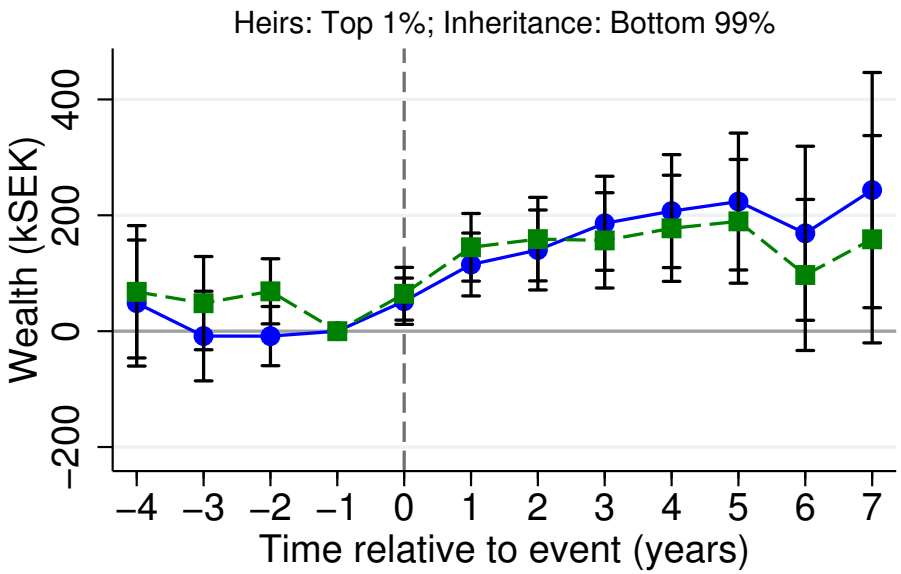


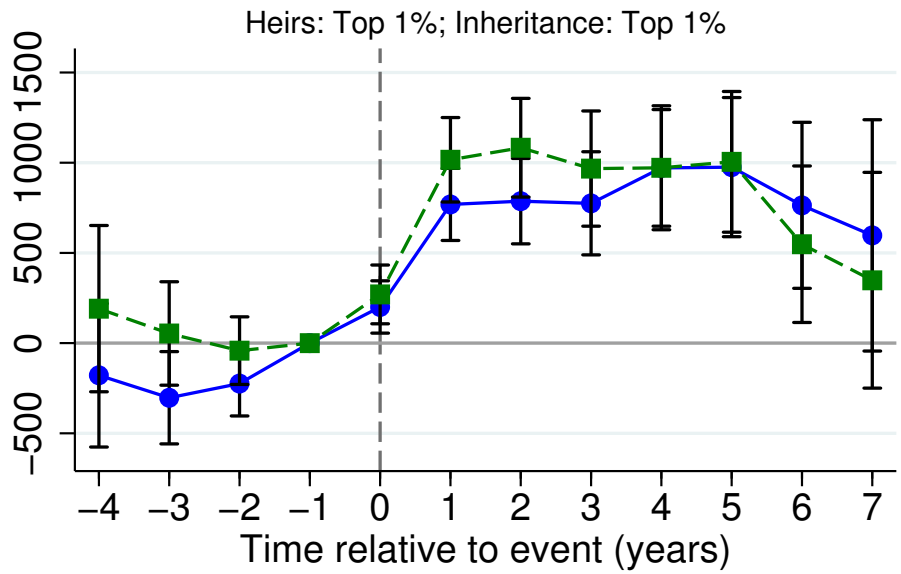


Heterogeneity by initial wealth and inheritance

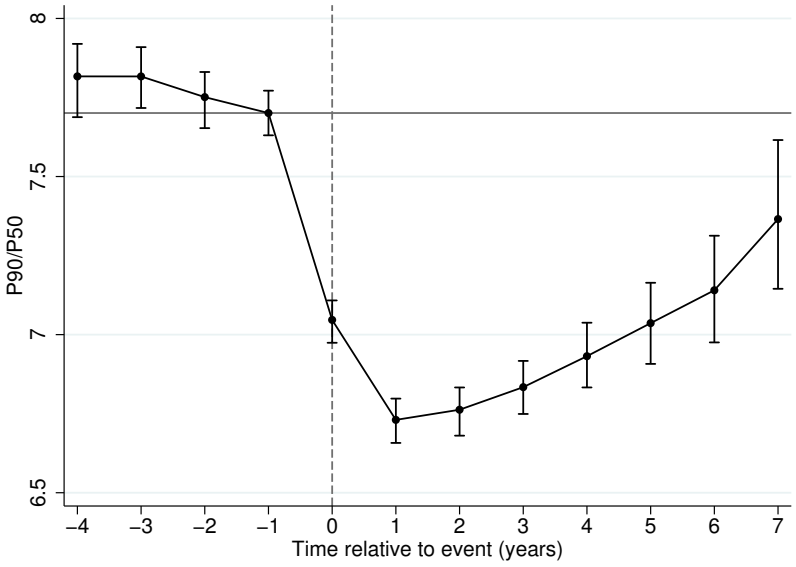


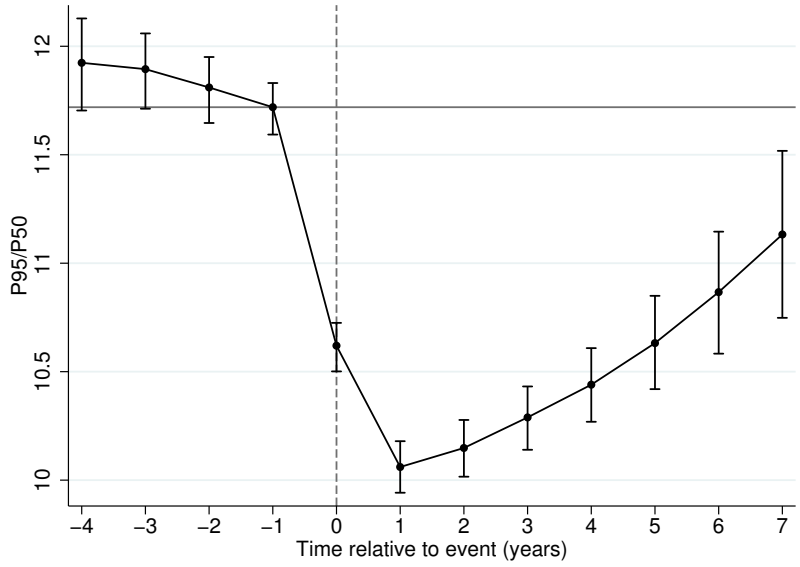


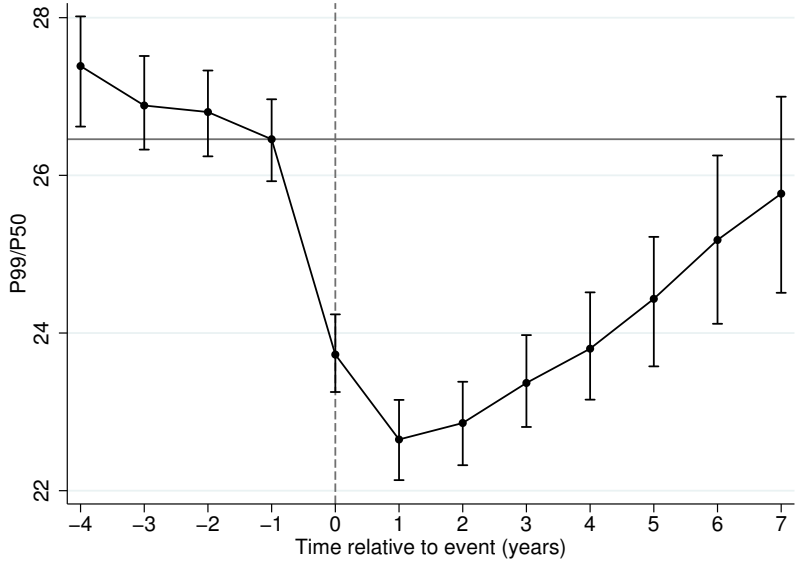




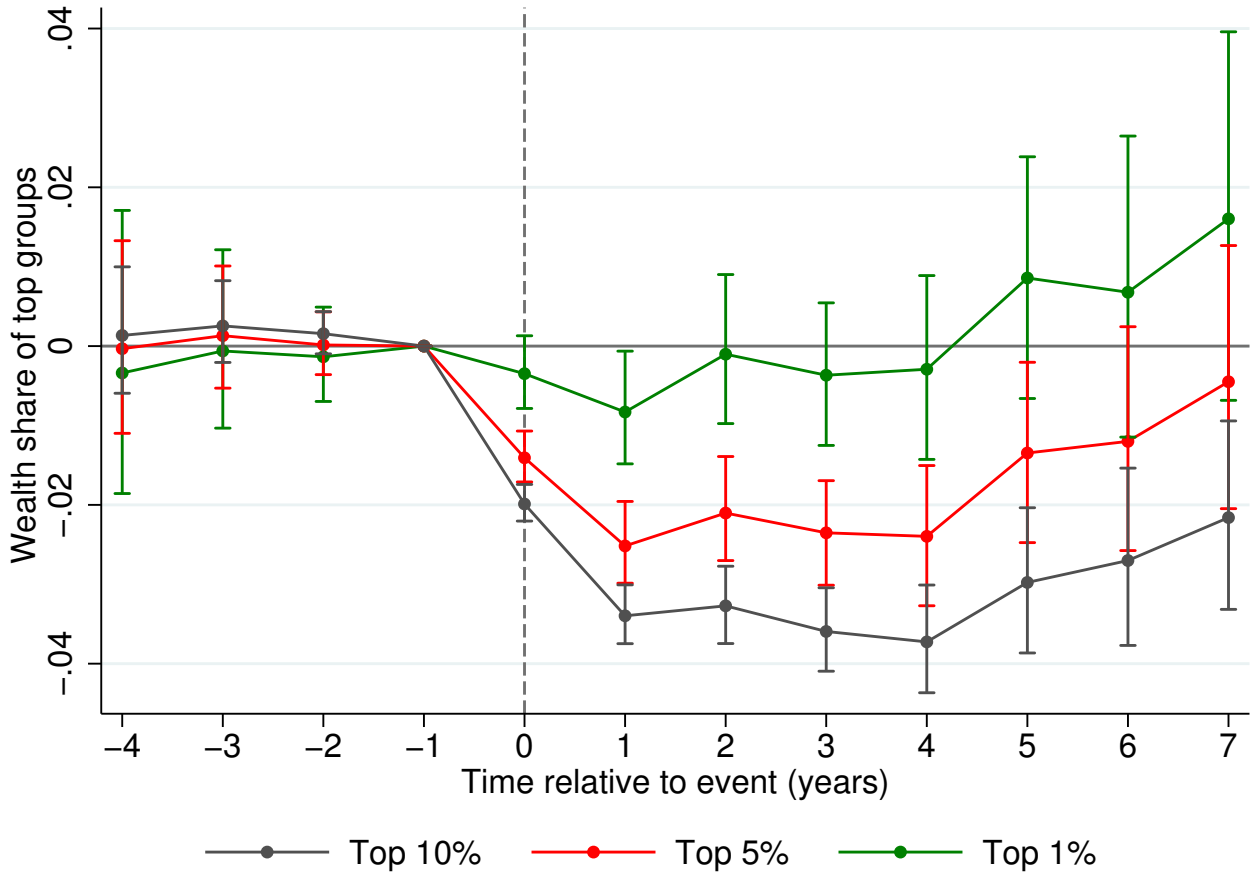
Long-run effect of inheritance on percentile ratios







Long-run effect of inheritance on top-shares



- Fat-tail of wealth distribution implies that LLN does not apply
  $\rightarrow$ Adjust the right-tails using Pareto-coefficient

Conclusions

- Wealth inequality, as measured by top shares' wealth, **declines** upon inheritance receipt.

- Seems counterintuitive. Why?

- It is true that richer individuals receive larger inheritances in absolute amounts, but relative to baseline wealth, poorer receive more!

  $\Rightarrow$ inequality $\Downarrow$.

- Over time, wealthy heirs with large inheritances **keep** inherited wealth. Poor consume theirs.

  $\Rightarrow$ Inequality $\Uparrow$!.

- Implications for inheritance taxation: Want to tax inheritances progressively, by **inheritance amount** AND by **baseline wealth**.

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REFERENCES

- Jonathan Gruber, Public Finance and Public Policy, Fifth Edition, 2018 Worth Publishers, Chapter 23.

- Nekoei, A. and D. Seim, 2019. "How do inheritances shape wealth inequality? Theory and evidence from Sweden". (link).

- Norton, M. and D. Ariely, 2011. "Building a Better America – One Wealth Quintile at a Time", Perspectives on Psychological Science 6(9). (link).

- Piketty, T. and G. Zucman, 2014. "Capital is back: Wealth-income ratios in rich countries, 1700-2010", Quarterly Journal of Economics, 1255-1310. (link).

- Saez, E. and G. Zucman, 2016. "Wealth inequality in the United States since 1913: Evidence from capitalized income tax data", Quarterly Journal of Economics, 131(2): 519-578. (link).

- Smith, M., O. Zidar, and E. Zwick. "Top wealth in the United States: New estimates and implications for taxing the rich", unpublished. (link).